Metalsmith

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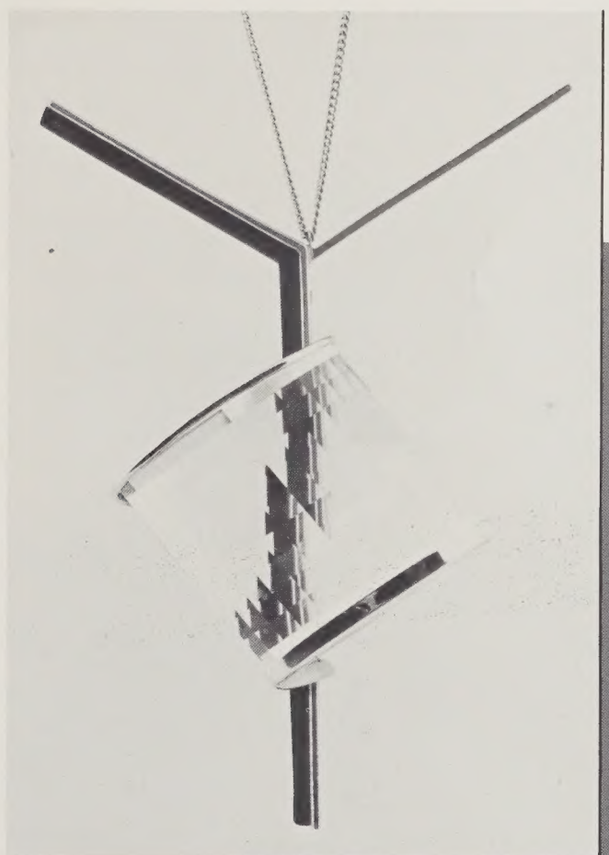
Metalsmithing in the 1940s and 1950s
Nathan Winkler
Guide to Northern California
Update II Mokume-Gane
Metalsmith Summer Programs



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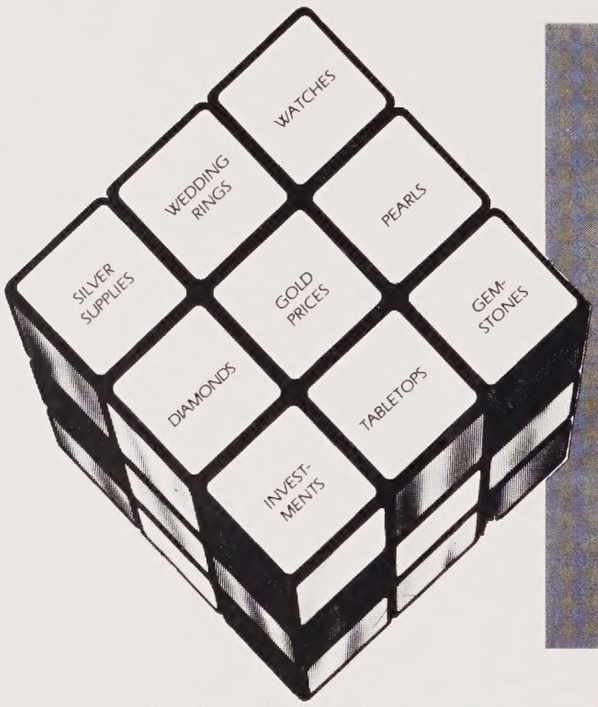

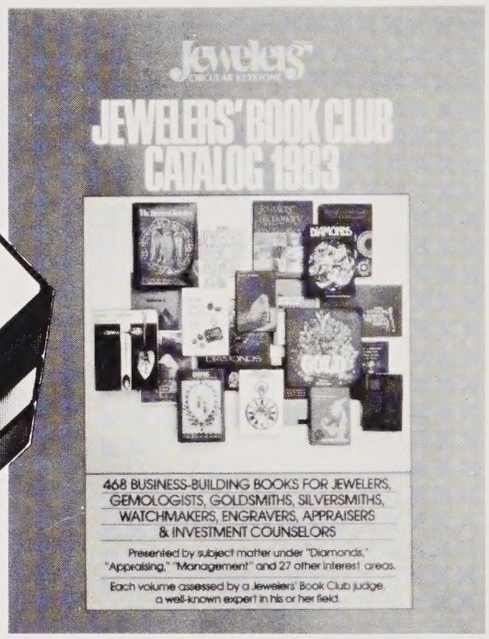
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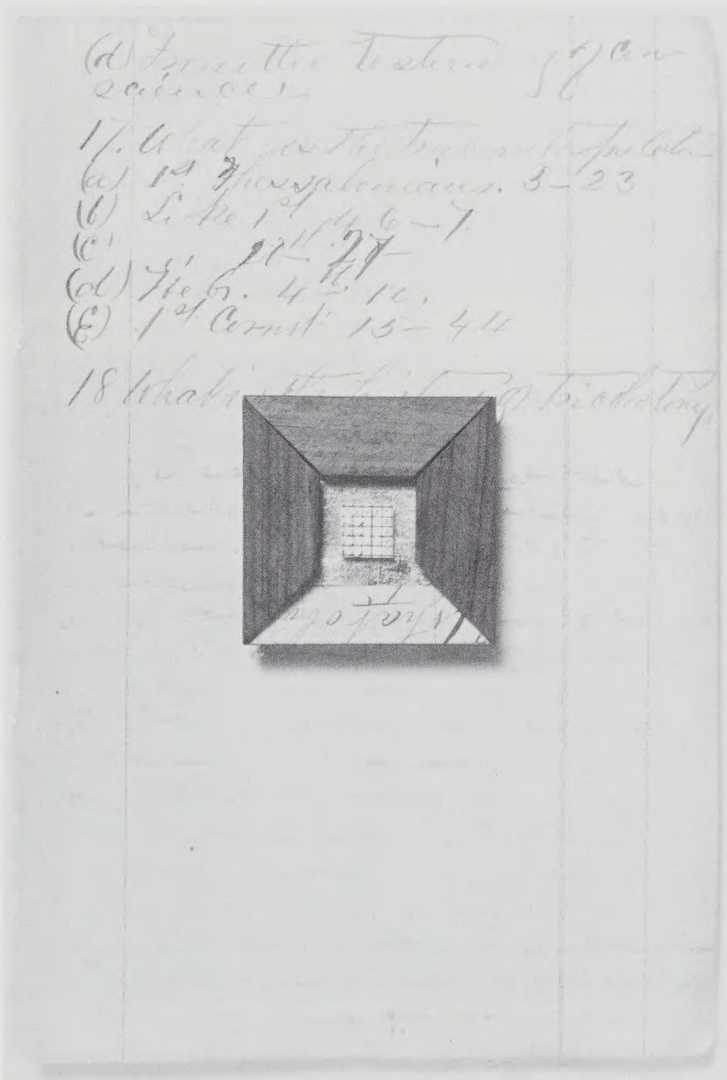

Bob Ebendorf, *Wall Object,* mixed media, 1982

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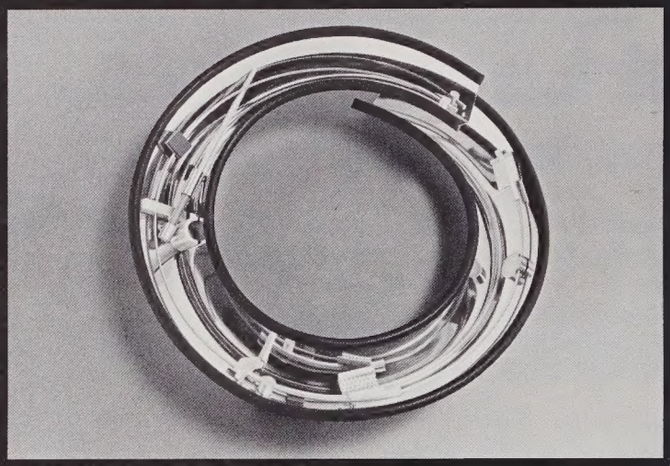

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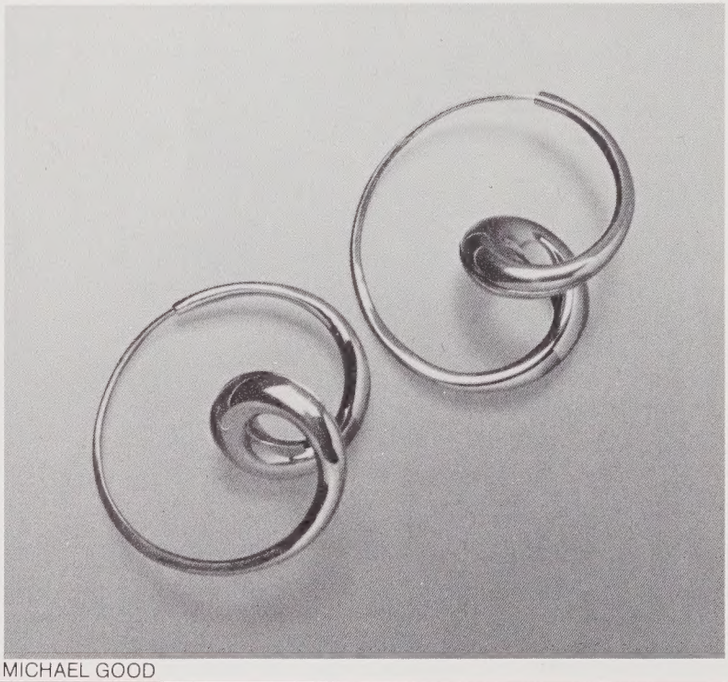

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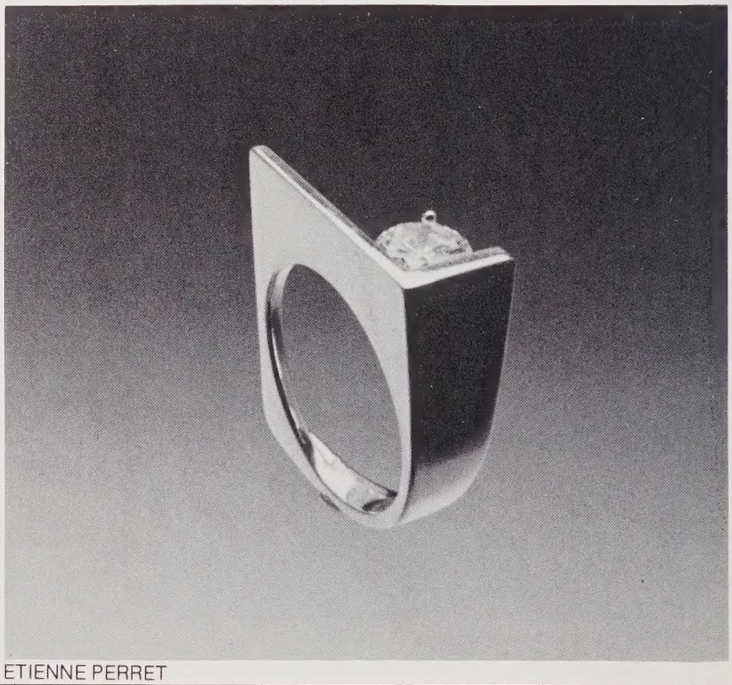

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Editorial

This issue contains a feature on Nathan Winkler—a name familiar to anyone associated with commercial jewelry, since he has been technical editor for *JC-K (Jewelers Circular-Keystone)* magazine for 20 years. As the article documents, Winkler has been intimately involved with the jewelry industry for over 63 years. Moreover, he is a a genuinely warm, intelligent, personable, dedicated, terribly industrious and interesting individual. His writing assignments have taken him around the world many times, thus adding greatly to his perspective on and overview of jewelry events. Although he officially "retired" several years ago, Nathan Winkler retains his zest for life and continues to write for *JC-K* and *Aurum*. Perhaps he is best summed up by an article soon to be published in *JC-K* in which he quips, "I regret that I only have one life to give to the jewelry industry."

Ordinarily, individuals in the commercial jewelry industry are of little interest to the artistic jewelry area, and that is unfortunate. For years Winkler has realized the ignorance and weaknesses of both jewelry worlds (artistic and commercial) and has been forging a much-needed link between them. Those who subscribe to *JC-K* surely have noticed the increasing number of articles featuring art jewelers, design, techniques and art events. While not all written by Winkler, these reflect a growing awareness by *JC-K* and the commercial jewelry industry of individual art jewelers. I believe Winkler has been a major force in trying to educate both worlds to the benefits of each other.

Further, Winkler has been very helpful to the Society of North American Goldsmiths and *Metalsmith*, generously providing support, sources, contacts and guidance. In short, he has devoted his entire life to all aspects of the jewelry world, including the artistic elements so often neglected by other industrial jewelers. We are fortunate for his interest, involvement and generosity.

—MB

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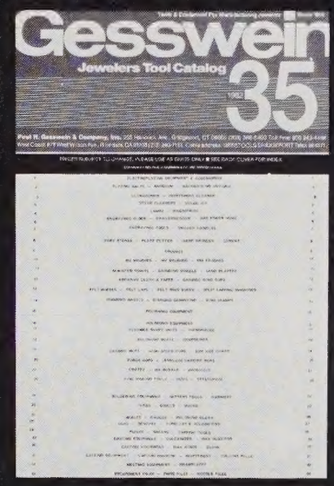

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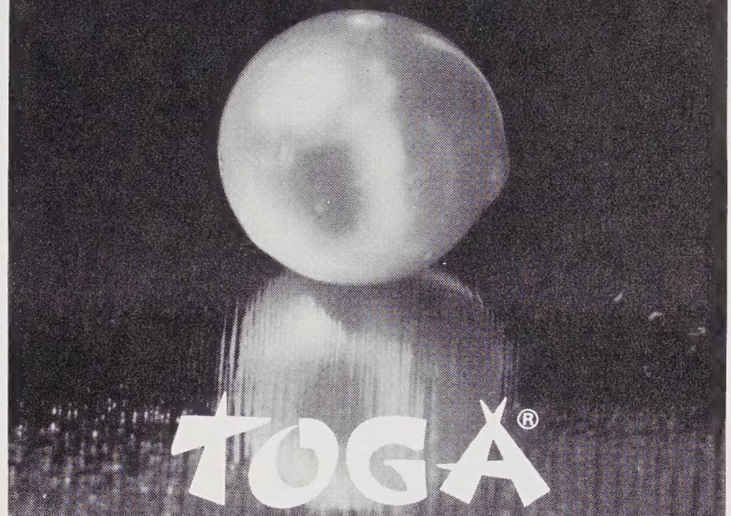

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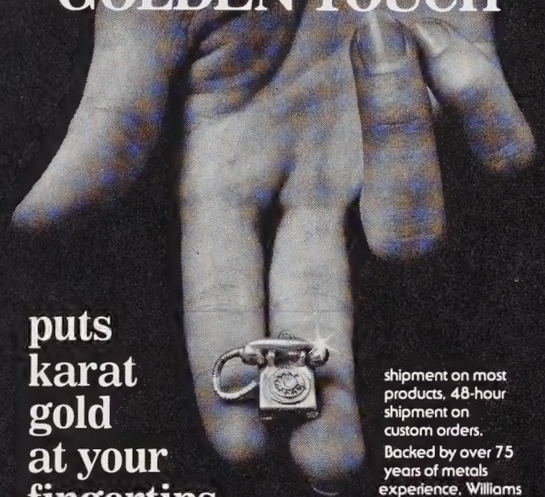

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A Remembrance
Hans Christensen
1924–1983

Hans Christensen, renowned metalsmith and beloved teacher, was killed in a car accident on January 16.

Christensen, in his 29th year of teaching in the School for American Craftsmen at Rochester Institute of Technology (RIT), held the nation's only endowed chair in the crafts, the Charlotte Fredericks Mowris Professorship in Contemporary Crafts. Internationally known, Christensen's work is in the collections of five Royal families in England, Denmark, Norway, Iran and Sweden and is owned by past United States Presidents, congressmen and other literary, entertainment and political figures.

At the time of his death, he had just completed work on a second chalice for the Vatican and a sterling silver, ceremonial collar for RIT. His work has appeared in exhibitions in Denmark, Sweden, Switzerland, Poland, France, Spain, England, Germany and the United States.

Christensen began his career in Denmark with the respected Georg Jensen's Silversmithy, where he worked for 10 years, the last four as head of the model department. Educated at the School for Arts and Crafts in Copenhagen and the School for Arts and Crafts in Oslo, Norway, Christensen taught silversmithing and design at his alma mater in Copenhagen before coming to the United States. He joined RIT in 1954 and began a distinguished career teaching two generations of metalsmiths in RIT's School for American Craftsmen.

Honors were many for Christensen, who during his career was presented two medallions by King Frederick of Denmark, had a coffee service he designed and made exhibited at the 1958 World's Fair in Brussels and was awarded lifelong status as a Fellow of the American Craft Council in 1979. His work has been reviewed in 13 American and 51 European publications.

Christensen was a member of Guldsmedehoikoleforeningen, Copenhagen, Denmark; the Institute of Arts and Letters, Switzerland; the American Craft Council, New York; and the Society of North American Goldsmiths.

"The beauty of Hans as a person was that his profound virtuosity as a craftsman was matched by the warmth and generosity of his nature. He radiated a joy in living that was translated creatively into his teaching and work. His students truly loved him," says Dr. Robert H. Johnston, dean of the College of Fine and Applied Arts at RIT.

"Professor Christensen was a distinguished faculty member, internationally renowned craftsman and wonderful friend to RIT," commented Dr. M. Richard Rose, RIT president. "The saying that a teacher affects eternity was written for teachers like Hans. His students have become leaders in their fields and he has served for all of us as the example of what a fine teacher should be. We will deeply miss him at the Institute."

Christensen is survived by his wife Els Christensen, his mother Valborg Christensen and brother Per Christensen. Both his mother and brother reside in Copenhagen. Memorial services for Christensen will be announced at a later date. His wife has requested people who wish to make contributions in his name make them to the School for American Craftsmen of Rochester Institute of Technology, Rochester, New York 14623.

Twenty-four years have passed since I first drove down the leafy colonnade of Rochester's East Avenue. I arrived where a little street, unbelievably named Goldsmith's Alley, ended in front of the decaying building that was home to the School for American Craftsmen.

I was to make that trip for four summers until both a journeyman's piece and a masters thesis were behind me. Two summers later, I made the trip again. Just for the fun of it. The fun of it, as always, was Hans Christensen.

I had come to R.I.T. in 1959 to study with the legendary Dane for whom no shape was impossible to raise or planish. The legend held up, but I also discovered Hans, the person. He would have awed me had he never swung a hammer at all. I am surprised at how much I remember after all these years. But with Hans, forgettable things became memorable.

I remember his wit. Did those nutty things happen only when Hans was around, or was it how he recreated stories of ordinary events that made them linger in your mind? Was there really a tourist who innocently ate the plateful of moldy cookies that one Copenhagen bartender had been using for years as "food" to comply with the local liquor laws? Did Danish akavit really look and taste like water to a group of Americans visiting the Georg Jensen factory until they fell down the stairs five minutes later? And what about that impromptu trip from Rochester to New York's Fulton Fish Market one night because he and Tage Frid had a nostalgia attack about the flounder they enjoyed in Copenhagen? Yes, those were funny stories, but the elfin grin, the laughing eyes and the fractured Danglish made everything seem funnier.

I remember his teaching. Summer students were a motley mix of dilettantes, degree candidates and assorted lost souls thrown together to form an educational mine field. For Hans, however, everyone was preparing for the Guild exam and he taught like he believed it. I heard that one winter when he was home nursing a cold, a group of students invaded his house, dragging hammers and stakes, and planished away merrily in the presence of his eagle eye, from which no vagrant bump or hollow could hide.

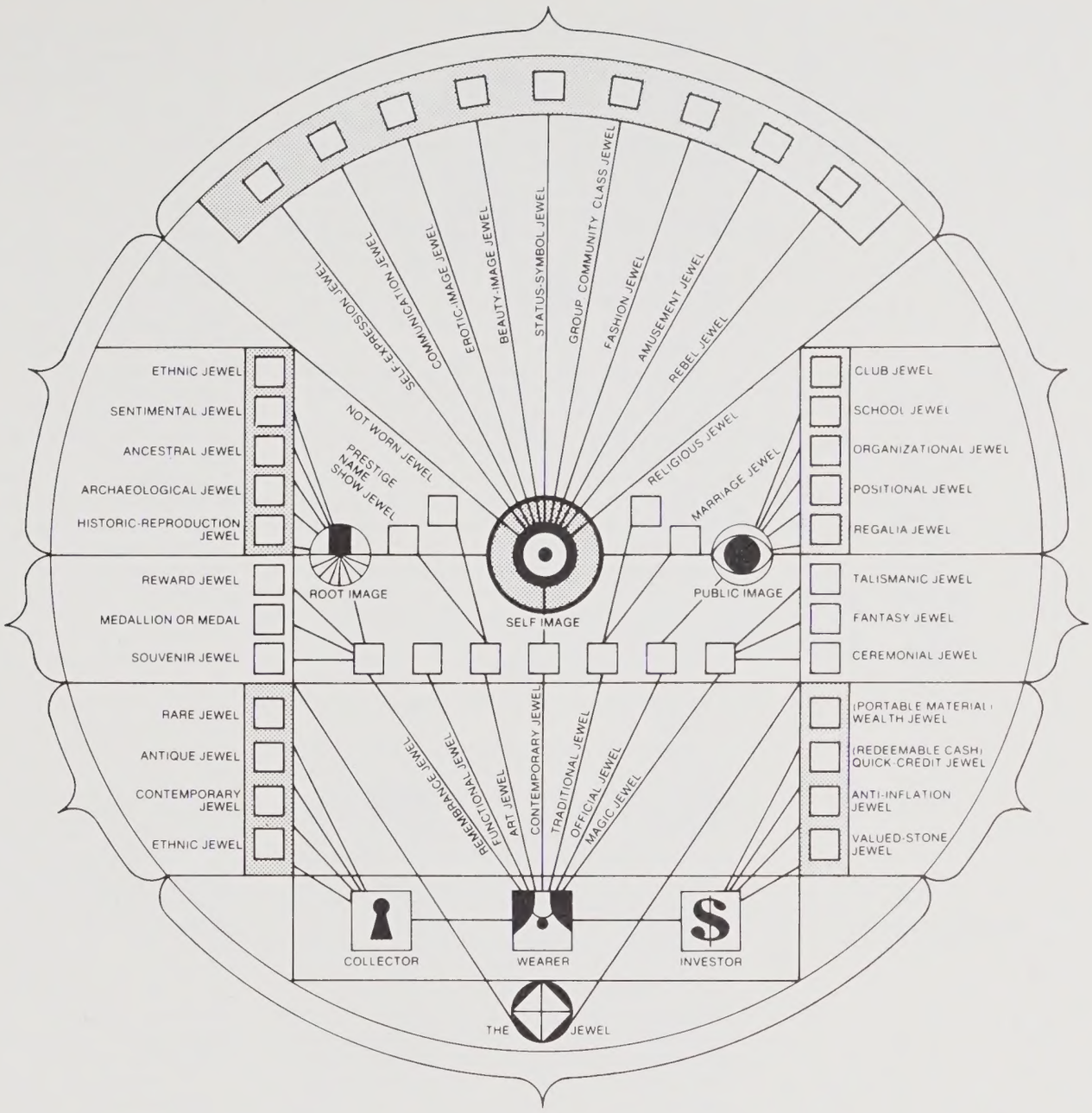
Lecturing in English was a creative art for Hans. How many generations from now will some silversmiths still call that Z-shaped tool a "snareling iron?" Yet, all the important ideas were thrust home with his special brand of pungent economy. I remember: "You may as well do it right; it's going to be ugly for a long time"; and "Hold the hammer straight or else you'll have all those little half-moons sitting there smiling at you."

He was frantic for months over the disappearance of a particular hammer. It was the "magic hammer," which planished beautifully even in the hands of hopeless clods or southpaws like me.

I remember his integrity. Hans's thoughts and actions defined the term "social responsibility." He cared about things very deeply and followed a code that might be considered old-fashioned by today's standards. Hans enjoyed sharing his ideas and convictions out on the lawn during coffee and lunch breaks. No, situational ethics was not his game, and enough years have gone by so I can tell about the time an advanced student sought advice about a prestigeous national design competition. Hans showed the student his entry. A short time later the student came up with a design that was remarkably similar. When the student refused to withdraw his design, Hans withdrew his own.

He was a gifted artist, teacher and person, and his leaving has created an unfillable space. I treasure my memories of Hans Christensen. I mourn the reason they all flooded back in one day.

—Bernard Bernstein



The Jewel and The Jeweler

The Jewel Mandala: Mapping the Jewel Motivation Cosmos

by Oppi Untracht

An amazingly broad range of motives govern an individual's desire to possess and use jewelry. These ideas are often the result of a person's exposure to the opinions of family, friends, and peers, or to the social and cultural milieu with which one feels identified. Motivations are compounded in complexity by the psychological forces that shape attitudes at all levels of contemporary society, by the circumstances of economics and politics, and by group opinions in general. Today, in addition to this melange, we are subjected to mass media communication, which pours out constant visual and verbal messages of what an individual should like and possess.

A diagrammatic *jewel mandala* is presented here with the hopes of enabling the reader to better understand the interrelationships of the various forces that contribute to the creation of our desires for jewels. The image of a mandala (the circular, radial "psychocosmogram" originating in India and used in meditation and the invocation of deities) is a particularly useful organizing principle.

At the base of the mandala is the jewel from which radiate those persons who by choice are involved with jewelry through their use of, or interest in it. The three main groups to which these persons belong are the *wearer* who of course is central, the *collector*, and the *investor*. Connected with each of these are types of jewelry that interest them, and

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Oppi Untracht is an American metalsmith living in Finland.

the reasons for their interest.

Most of the mandala deals with the functions that jewelry serves for the wearer. Starting with the more basic types, which are later subdivided, jewelry can be classified into the following groups: jewels whose main function is *remembrance;* jewels that serve an actual *functional* purpose such as holding clothing parts together; jewels with *artistic* purpose, made to express an esthetic; jewels concerned exclusively with *contemporary* concepts; jewels that are dominated by *traditional* concepts; jewels for *official use* that express the hierarchical, structured nature of society; and jewels with *magical powers,* concerned with the irrational and with an individual's inner fantasy life.

All of these uses relate to areas that concern basic aspects of the human being: the *self-image,* the *root image,* and the *public image.*

By *self-image* is meant the inner concept or sense of identity each individual has of his or her being, in which the whole of the conscious and subconscious personality is integrated; this is the image which he or she desires to project to others. Because of its primal importance, and because it is the origin of self-identification, it is placed at the central axis of the mandala. The motives that govern a person's use of jewelry to express the self cover a broad spectrum of personality needs that together act as an individualizing force. Any single one of these motives may be in operation at a given time, or several can be co-active, even when only one jewel is in question.

Radiating from the self-image are the universal motivations that a jewel's possession can incorporate and satisfy. Primary is the desire for *self-expression,* the affirmation of the ego and the psyche as expressed by an individual's intellectual, emotional, and impulsive activities and predispositions. This basic motivation is shared—the maker experiences it in creating the jewel, the wearer, through the choice he or she makes in acquiring it. That choice may be determined by a wish to *communicate* a general impression to others, or even to supply specific information about the wearer, such as, "I am conventional," or, "I am an extrovert." Of great importance is the desire to enhance one's natural endowments and project an impression of *beauty,* often transformed into an erotic image that may send a provocative sexual message. The desire for *social status* acts as a means of bolstering the feeling of self-importance, and is a powerful and common motive in choosing jewelry. Status may or may not be directly connected with the intrinsic value of a jewel, but it is certainly based on whatever is considered important by the individual and the group or society to which that individual belongs. Connected with status satisfaction is the desire to be *identified with a particular group, community, or class.* An active or passive desire to belong to a *cultural milieu* (which may cut across all social classes) is the automatic result of the acceptance of *fashion-dictated jewelry.* Jewels that satisfy an impulse to *amuse oneself* suggest an attempt to charm others as well. Jewelry can also contain a message *declaring rebellion* against established esthetic attitudes, or even social or political conditions. This declaration can be the result of sincere conviction, or simply be a desire to shock others and attract attention.

Tradition may govern an individual's choice of jewelry, as in the use of *religious* or *rite-of-passage jewelry,* such as *marriage* jewels. These jewels publically declare specific facts about the wearer that he or she wishes to make known. At the other extreme are the jewels that have intensely *magical or private significance,* such as *talismans,* jewels that indulge a secret fantasy, or those used for *ceremonial* purposes. *Sentimental* jewels of *remembrance* may be as personal as a gift from a loved one to commemorate a pleasant experience, an occasion, or an event; or, on a less personal level, they can be a *reward* for services rendered, or an earned achievement in the form of a medal or a medallion. In a special class are *art* jewels purchased because they are created by jewelers of repute; and the prestige of ownership provides the wearer with a feeling of self-importance. In this category are *jewels with double lives*—in one life the jewel is worn, as any jewel; in the other, it is an independent, decorative object placed on a stand or wall—and the *never-worn jewel* meant only for display as an object.

In the mandala, flanking the self-image are the root image and the public image. The *root image* involves an individual's attitudes about his or her origin, and one's jewelry can express a desire to identify with or remember it. These feelings may incline a person to choose to wear *ethnic* jewelry used or produced by one's community of origin. Sentiment or reverence felt for an ancestor can motivate the use of *inherited or ancestral* jewelry. Similar feelings may spark the purchase of jewels manufactured by jewelers of traditional cultures or countries of origin to which one feels connected. *Reproduction* jewels (which are copies of historic or archeological jewels usually found today in museum shops) may induce a feeling of historic connection with the originals. Conversely, a person may opt to forget or obscure his or her origins by adopting the use of the ornaments worn by other groups or strata of society.

The *public image* mainly concerns the use of jewels that have some official or organizational significance. Wearing *club* jewelry involves a desire to belong to a specific and perhaps exclusive group of persons having some common interest or other reason for being a group, and such jewels become a means of identifying a fellow member. Similar factors are at work in the wearer of *school* jewelry, which may also involve feelings of sentiment or elitism. *Positional* jewelry is the kind to which the wearer is entitled because of holding an office or a particular position in a society or a community. *Regalia* jewels are those worn by persons to whom certain rights and privileges are due. If such a person is of royal birth, these will include crowns, scepters, ensigns, necklaces of state, and the like. In the case of an office holder in a fraternal organization, such as the Freemasons, a collar of state or other regalia might be worn on ceremonial occasions.

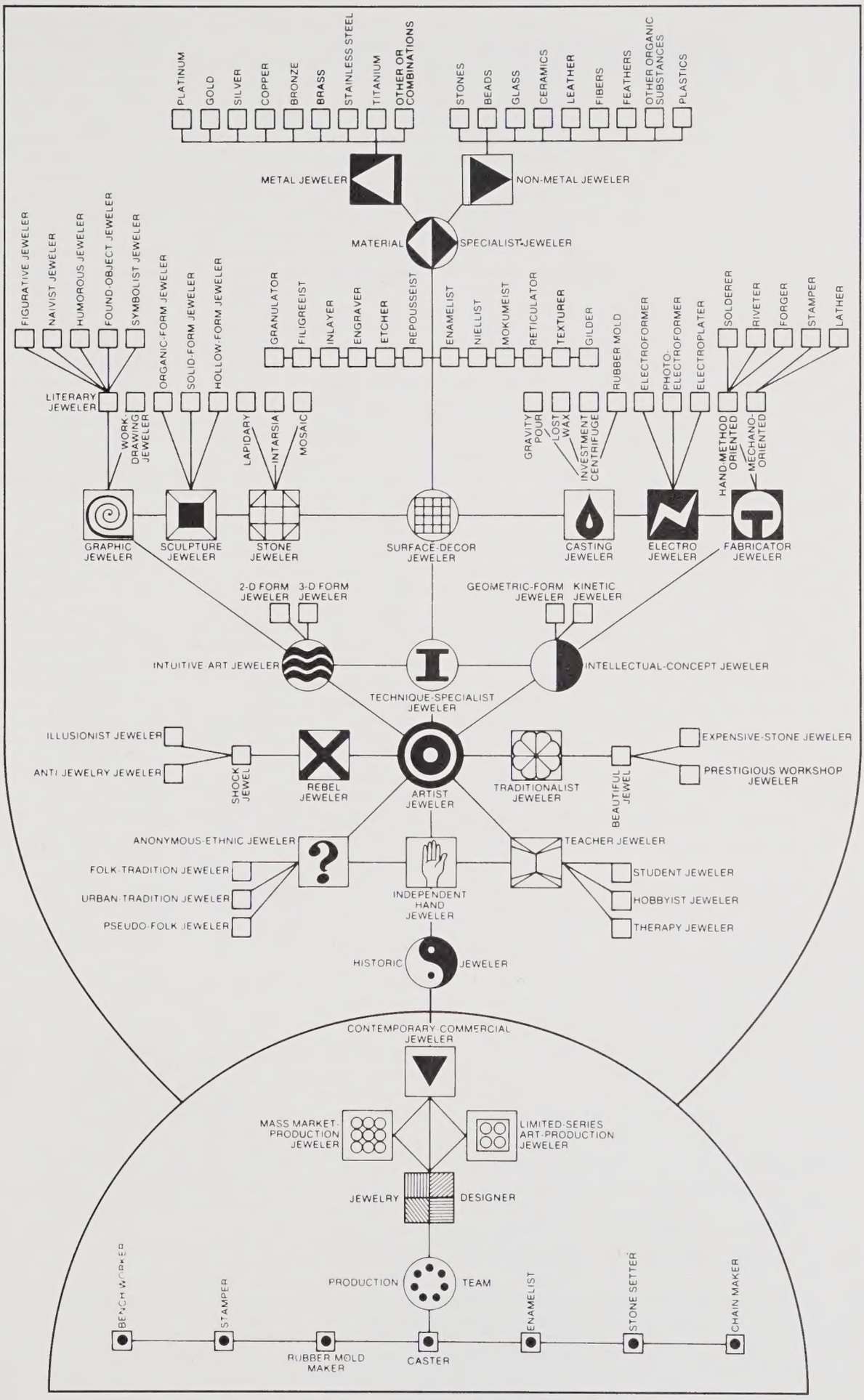
An *investor* may also wear jewelry, but the dominating motive for purchase is the thought that it is a convenient means of concentrating *wealth* in an easily *portable* form. Surplus cash converted into jewelry puts it in a form that can be easily redeemed. If necessary, it is usable as a basis of credit, and the investment becomes a means of keeping up with inflational depreciation in the value of currency. Precious jewelry increases in market value at a rate commensurate with inflation. *Valuable* jewels that stay in a bank vault and are rarely if ever worn belong in this category.

A *collector* almost invariably is a jewel lover, unlike an investor who may or may not actually like the jewelry purchased. A collector's motivations may also be diverse and might include the purpose of investment, but this generally is a consideration of secondary importance. The choices made are highly selective and may follow a decidedly restricted area of interest. *Rarity, antiquity, ethnicity,* or "avant-garde-ness" are the most frequent bases for collections, although, of course, not the only ones.

A Polarized Convocation of Jewelers

We cannot speak of the world of jewelry today without giving due recognition to the *artistic-jeweler* upon whom all developments center. He/she is both procreator/genetrix, begetter/conceiver of all the concepts endlessly poured into the jewel object. The term artist-jeweler can be interpreted narrowly to include only influential jewelers, but it can also have an all-inclusive meaning to incorporate both

A Polarized Convocation of Jewelers



greater and lesser members of this ideologically and physically far-flung family as long as their work contains an element of originality.

To identify each member in the jeweler family, it has been called here to a convocation whose seating plan is polarized horizontally and vertically to indicate diagrammatically how the directions of interest of the various members relate to each other. It must be made clear from the start that the arrangement of this seating plan is *not* to create a hierarchy, nor to give undue prominence to any particular member, nor to divide the family into opposing camps (even though conceptual opposition does occur). The plan's purpose is only to identify and to locate members in a manner that shows their interrelationships. Some members may belong in more than one location. If by some oversight *you* have not been given a place, please understand that the omission was not deliberate, and that you too are invited.

What emerges from this plan is the fact that a remarkable diversity of interests exists within the family. In the light of such diversity, the only means of creating harmony within the family is through mutual tolerance. We all must joyfully accept the many levels and directions that the gift of creativity, a human being's greatest asset, can take.

Therefore, at this meeting, no member is permitted to take an aggressive stance, nor to force another into a defensive position in order to give importance to or gain support for his or her point of view. Neither is there any place for ridicule, or dispute about the greater significance of one direction of interest as opposed to any other. We suggest that any such attack in reality is a disguise for insecurity, and we firmly believe that each member of the family can be strong in his or her own right.

A few points should be made in explanation of the plan. The all-encompassing artist-jeweler is given a position of prominence at the exact center. He or she has forebears in the historic jeweler, who is not present but whose presence is felt. At one end of the hall is the assembly of commercial jewelers, a part of the family in very good standing, but whose contact with other members of the family is unfortunately limited: unfortunate because there is much that can be learned from this branch of the family, as those artist-jewelers who have on occasion crossed over into their territory well know. Commercial jewelers generally supply a mass market by employing mass-production methods, but art production jewelers also exist who create limited-series jewels, often by hand technology. The production team upon whom the commercial jeweler depends to execute the designer's approved ideas is also present. The team consists of highly skilled artisans who are specialists in their particular areas of work.

In the center of the next horizontal pole, at the side of the artist-jeweler, is the independent hand jeweler. To his or her right is the teacher-jeweler and those to whom he or she relates, such as the student jeweler, the hobbyist-jeweler, and the therapy jeweler. The teacher-jeweler also has connections with and may also be an artist-jeweler. At the left on this pole is a virtually unknown member of the family, the anonymous ethnic jeweler who actually has no wish to be anonymous, but remoteness and lack of contact with other, nonlocal jewelers forces this anonymity. This member, also an artist-jeweler, sends regrets, and the message that the only way to meet him or her directly is by travel; indirectly, by studying publications or seeing his or her work in museum collections. Connected with his branch are the members who follow a true folk tradition or an urban tradition which nevertheless bears a distinct cultural identity. Also related, but living physically removed from the source of inspiration, is the jeweler who sympathizes with this branch, and whose work is strongly influenced by ethnic jewelry, the pseudo-folk jeweler.

In the next horizontal pole, at the right is what might be termed the conservative element of the family, though their ideas are constantly being influenced by those of the artist-jeweler. Those jewelers who follow traditional jewelry concepts often pursue the stylistically changing direction of the beautiful jewel, a concept that many contemporary artist-jewelers have abandoned. Unique jewelry whose purpose is simply to be beautiful often makes use of expensive stones, and is produced in the world-famous, long-established workshops found in the major cities of the world.

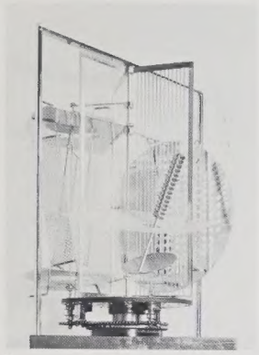
To the left of the artist-jeweler is the rebel jeweler, the radical of the avant-garde, a pioneer in reform who challenges established concepts of design, subject suitability, materials, etc. At the extreme left are the nihilist jewelers, some of whom think that all jewelry is decadent and superfluous, and should be abolished, and that all we need is the illusion of jewelry. Antijewelry jewelers are also necessary because in a culturally free society, following the eternal cycle of creation, flowering, destruction, and re-creation, negation ultimately brings forth an affirmative response.

The following horizontal pole divides from the technique specialist jeweler and branches to the left to the intuitive artist-jeweler, and to the right toward his or her opposite, the intellectual concept jeweler. Continuing in the intuitive direction are the branches to the two-and three-dimensional jewelers who are influenced by graphic and sculptural idioms. Several branches continue from these to follow related paths. Returning to the intellectual concept jeweler, that direction includes the geometric form, and the kinetic or moving-form jeweler, and these are connected with the fabricator-jeweler in the horizontal pole above.

The next horizontal pole includes the major directions of interest among creative jewelers today. At the center is the surface decoration jeweler, flanked on the left by the stone-oriented jeweler and the afore-mentioned graphic and sculpture jewelers. On the right are the casting jeweler, the electro-oriented jeweler, and the fabricator-jeweler. Each of these has attached specialist branches, the largest number emanating from the surface decoration jeweler. A relatively new member of the family is mechano-jeweler.

At the top of the vertical pole is the material specialist jeweler whose area divides basically into the metal and nonmetal groups. From these follow the many branches that indicate particular areas of specialization.

The meeting will now come to order. ■



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Structure Concepts and Design Sources

by Robert Cardinale and Hazel Bray

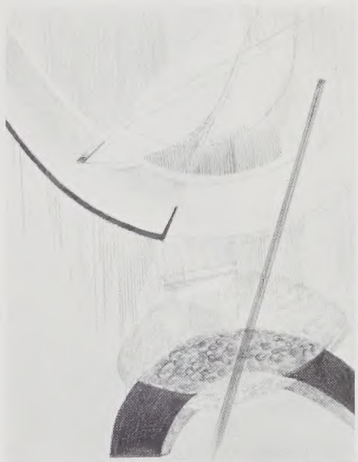
To search the roots of American jewelry and metalsmithing in this century is to continually run across the name of Margaret De Patta. Why De Patta's perception of the potential for good jewelry design and her own work towards this end have had such a strong impact on the field are questions this article attempts to answer. By examining individual pieces to reveal their structure, concepts and sources, we hope to clarify De Patta's important contributions to American jewelry design and fabrication.

De Patta was born in 1903 in Tacoma, Washington. She studied at the Academy of Fine Arts in San Diego from 1921–1923, at the San Francisco School of Fine Arts from 1923–1925, and then set out for New York City in 1926. Here she received two scholarships at the Art Students League, where she completed her formal training in painting and sculpture. De Patta returned to San Francisco in 1929 where she began to etablish herself as a painter. By 1934 until her death in 1964 most of her time was devoted to metalwork. Her career as a jeweler brought her to the forefront of the craftsman's world and to an acknowledged position of leadership in the field. Her legacy was a body of work that clearly defined her approach to modern design based upon the principles of abstract art.

How and when Margaret De Patta first became interested in modern design or the theories of modern art is not documented in the artist's notes and papers that are available today. One can only surmise that she encountered the increasingly visible work of the modernists, especially that of the leading Europeans, in New York galleries. As a young painter in San Francisco, De Patta's experience would have been continued by the small but growing avant-garde's theories and work in varying forms of abstraction and cubism. Also, the newly opened San Francisco Museum of Art with its modern collections and shows was available to her by the second half of the 30's. There is no direct evidence of a key figure or of a single convincing experience that triggered her dedication to modern art. It may well have been the result of a growing, accumulative attitude that developed as she searched for a new rationale. The evidence remains in the work itself.

The first clue concerning her interest in modern jewelry design was an occurrence in 1929 when she could find no wedding band which incorporated the qualities of design manifested by the best art of the period. It was then that she realized the rich posibilities of good contemporary jewelry design.[1]

This discovery sparked the beginning of a remarkable career. "Being highly motivated, she organized and struggled through a concentrated apprenticelike program



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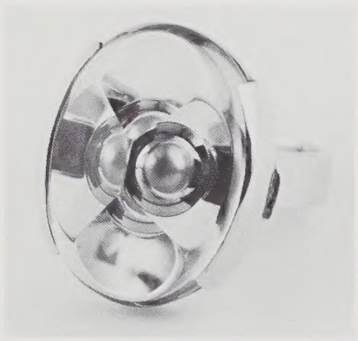

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1 Laszlo Moholy-Nagy, *Light Space Modulator*, 1922–30. Mobile construction: steel, plastic and wood, 59½" with base. Photo courtesy Fogg Art Museum, Harvard University
2 *Pendant*, 1948. Yellow gold with rutilated quartz crystal slab. Collection: Eugene Bielawski

3 Laszlo Moholy-Nagy, *Mills No. 2*, 1940. (Diagram). Oil on plexiglass, 34⅞ x 26". Location of original work unknown. Drawing by Robert Cardinale
4 *Ring*, 1942. Yellow gold with faceted topaz and pearl. Photo: Peter Brown

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with a professional San Francisco metalworker named Armin Hairenian."[2] The intensity of her motivation can be better understood when we note that her association with Hairenian continued for only two months. Between 1929 and 1934, when her painting ceased, she continued to develop her metalworking skills through self-instruction and gradually increased the quantity of her work. She established a metal studio in 1935 and actively began producing pieces for clients. The following year, in 1936, her work was exhibited for sale at Amberg-Hirth, a well-established San Francisco retail outlet for fine handmade objects.

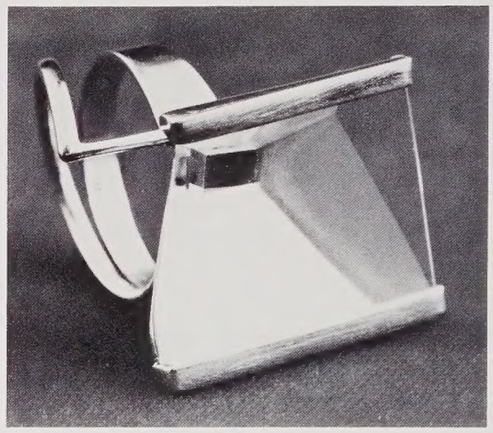
"Her early designs, much influenced by ancient Columbian, Turkish, Egyptian, Etruscan, and Mayan jewelry, evolved largely from the basic forms of metal (sheet, wire and grain) and retained some influence of her training as a painter as well."[3] At a later date, she noted in a partially developed resume, ". . . . 1934—Major time devoted to metal work."[4] The same resume continues, ". . . . 1934 to 1940—Devoted to structural development of design and exploration of new structural means of stone mounting. . . ."[5]

The most important development in De Patta's work and the one that has had the greatest impact on American metalwork and jewelry was her studies of transparent stones, which began in 1939. With this new information being actively pursued, she attended, in 1940, a summer session at Mills College in Oakland, California, where she met and worked with Laszlo Moholy-Nagy. It must be remembered that De Patta was a mature artist, nearly 37 years old when she began her studies with Moholy-Nagy.

Moholy-Nagy, a Hungarian by birth, who joined the Bauhaus faculty in 1923 and eventually became one of its most influential teachers, had emigrated to Chicago in 1937. There he assumed the directorship of the ill-fated New Bauhaus school, which was to close a year later. In 1938 he opened his own School of Design (now the Chicago Institute of Design) with most of the New Bauhaus group as faculty. His deep commitment to Constructivism and its basic tenets of the rigorous structuring of space through the use of line, light and color must have had an effect on De Patta. In 1940–41 she went to Chicago to study with Moholy-Nagy.

While in Chicago she met and married Eugene Bielawski, who taught design at the school. Thus was formed a supportive relationship that carried the couple through a lifetime of design, production and marketing challenges.

Moholy-Nagy's Constructivist philosophy was directly translated into his paintings and sculpture. His *Light-Space Modulator* of 1921–30 (Figure 1), for example, includes many elements of Constructivist concern: rectangular planes slicing space at oblique angles, implied and real motion of screens, punched plates, revolving discs and vertical rods that stabilize the entire construction. Shadows cast through translucent materials by screens onto adjacent planes were techniques that Moholy-Nagy continually explored. This work, along with his direct admonitions, such as, "Catch your stones in the air. Make them float in space. Don't enclose them"[6] were to inspire De Patta to create pieces such as her elegant pendant of 1948 (Figure 2). The major element in this piece is a rutilated quartz crystal slab. The rigid angles



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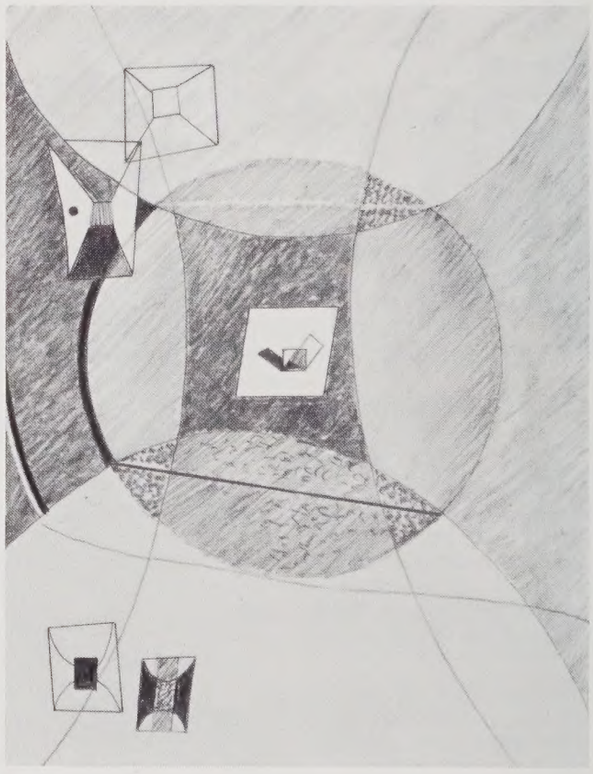

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5 *Ring,* 1947. White gold with clear and translucent quartz crystal and black onyx. Photo: Peter Brown

6 Laszlo Moholy-Nagy, *Composition,* 1942. (Diagram). Oil on incised plexiglass, 22½" x 17¼". Location of original work unknown. Drawing by Robert Cardinale

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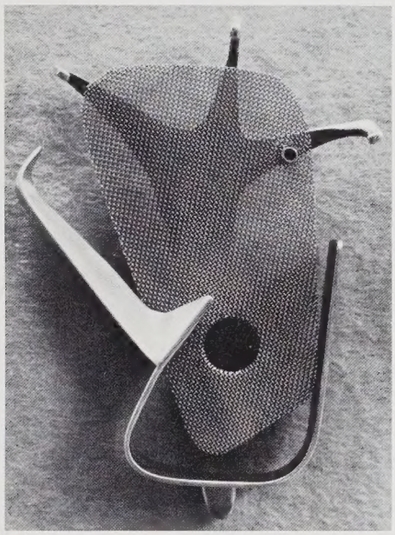

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7 *Ring,* 1947. White gold with tourmaline crytal embedded in quartz crystal. Photo: Peter Brown

8 *Pin,* 1949. Sterling silver and stainless steel screen. Private Collection. Photo: Peter Brown

9 *Pin,* 1944. Sterling silver with quartz crytal sphere. Photo: Peter Brown

created by dramatically suspending the stone from the daring cantilevered section through which the chain passes are echoed by the rutilations of the quartz crystal itself. The strong movement created by the interior lines is counterpointed and paralleled by the metal rod which secures one face of the piece to the other.

In the Moholy-Nagy piece entitled *Mills No. 2,* 1940, oil on plexiglass (Figure 3, shown in a schematic drawing), the linear background hatching of the piece mimics the natural rutilations of the quartz which De Patta used so extensively in her work. As stated earlier, De Patta had just begun her studies of transparent stones in 1939. Because of this foundation work in light reflection and refraction, she made good use of Moholy-Nagy's theoretical impetus. In her 1940 cabochon quartz crystal and black pearl piece (Figure 4), one can also see a strong similarity to *Mills No. 2.* In both the interior of the translucent painting and the center cross section of the ring, the fascination with concave reflecting and refracting surfaces is excitingly present. Here De Patta and Moholy-Nagy present two brilliant and similar solutions to the complex problem of light as it is manipulated by curved surfaces.

Later, in 1952, De Patta was to articulate her notions of transparency: "One of the major contemporary concepts [of jewelry] is that of 'transparency.' It is evidenced in architecture, in our new transparent building materials, in fabrics, furniture, furnishings, film, science, painting, and sculpture. Traditionally the transparent gem stones were cut in cabochon and faceted shapes designed to reflect light and enhance color. When thinking became concentrated on the 'quality' of transparency it became obvious that new types of stone cuts were necessary and another vast area of exploration opened for the pioneer. An analysis of the possible visual and optical effects produced the following list—transmission, reflection, magnification, distortion, illusion, area of invisibility, visual perspective, and space enhancement."[7]

The ideas and concepts explored during this early period continued to manifest themselves in De Patta's experimental work throughout her productive career. Moholy-Nagy's structural and intellectual investigations of light passing through translucent objects is freshly mirrored in a ring of 1960 (Figure 5). This white gold ring with a clear and translucent quartz crystal suspended against a rectangular piece of black onyx clearly reflects the 1942 Moholy-Nagy *Composition,* oil on incised plexiglass (Figure 6, shown in a schematic drawing). That the two pieces were produced approximately 18 years apart underscores the magnitude of the impact that this teaching had on De Patta. He was clearly a deep and rich source for her work.

De Patta worked out complex stone cuts in lucite, which she sawed, polished and even drilled holes through to correspond to the rutilations of the desired crystal. "She then took her models to Francis J. Sperisen, Sr., a San Francisco lapidary, who understood and shared her belief in the potential of modern jewelry and who, since about 1941, worked closely with her in developing new experimental cuts for gem stones."[8]

Exploration of the tops, undersides and insides of transparent crystals led to the fascinating use of light and its principles of reflection and refraction by De Patta. Her 1942 ring of yellow gold and a faceted topaz set over a

pearl created multiple fragments of reflection of the pearl onto the surface of the faceted quartz. The faceting on the quartz is actually on the underside of the piece, while the top of the crystal is finished in a moderate cabochon form (Figure 4).

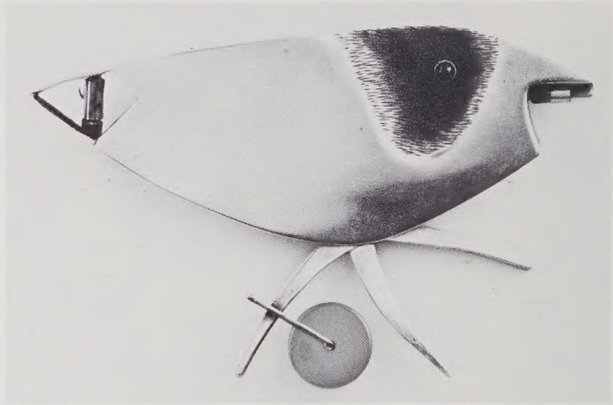
Both 1947 rings explore the illusion of perspective created by the oblique angles at which the quartz crystal is ground. In Figure 6 the addition of the strong but simple diagonal element of embedded tourmaline adds a dramatic counterpoint to the perspective illusion. This impact of the diagonal slash is also explored by Moholy-Nagy in his *Light-Space Modulator* (Figure 1) and is evident as well in the *Mills No. 2* diagram (Figure 3).

Probably the single most important piece of De Patta's work incorporating the light play of the faceted quartz crystals is the 1956 pendant (on the cover). The piece is white gold and ebony with rhomboid quartz crystals faceted in opposing courses. This cross faceting provides the fascinating illusion of motion while the piece is static. The section of metal that holds the stone in place is virtually hidden by the blind areas of the stone. De Patta called such stone treatment an "Opticut." The exaggerated "Y" form dramatically and gracefully carries the large and heavy crystal so that it appears to float in suspension at a point of tangency with the vertical element of the gold and ebony structure. The solution of control of light, space and motion is monumental, while the object remains a real, wearable piece of jewelry.

De Patta also explored with fascination the effects of light and pattern produced by stainless steel screen. In her 1949 pin (Figure 8), the screen is used as a slightly rounded version of a distorted rectangle. The piece is pierced with a round hole, allowing light to pass through unobstructed. The screen itself is riveted to an oxidized sterling silver backing. Combinations of screen and form appeared earlier as in Figure 9.

Movable and changeable elements were another area explored by De Patta. Two 1950 pieces, both pins (Figures 10a, 10b and 11), convey the success of this concept. Figure 11 shows again the strong Bauhaus influence of Moholy-Nagy and his colleague Piet Mondrian. Both of the circular forms could be repositioned to give the piece exciting variation. The other pin, an ambiguous bird-fish form, is designed so that the tripod element can be rearranged or hidden completely. In another pin, Figure 12a and 12b, she plays with the exciting movement of an amorphous form pivoting to reveal or hide coral and malachite stones according to the wearer's mood. These soft forms seem to be echoed in her use of beach stones, as exemplified in a later pin (Figure 13) of sterling silver with turquoise inlay.

These ambiguous forms of bird-fish, the boomerang forms and the solid stone pieces seem to have lost the sense of spatial exploration that characterized the rutilated quartz pieces. They deal with unarticulated mass frozen in space. While they are pleasantly composed, they are not free to articulate the space in a dramatic or surprising manner. Their mass is emphasized and thus they are static, tangible volumes. They do not float or soar but rather are stationary and opaque. They are smooth, soft and pleasant. They do not partake in motion or transparency and thus lack the vitality of the earlier work. One can speculate that concerns with mechanism or the use of new materials may have interfered with or taken prece-



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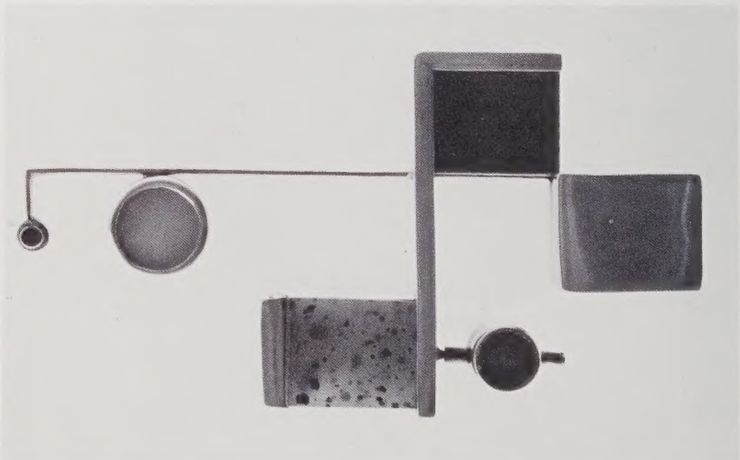

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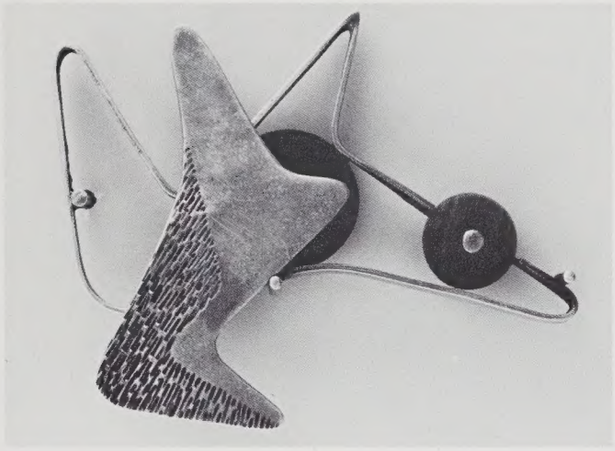
10a *Pin*, 1950. Sterling silver and white gold with green and black onyx (open position). Photo: Peter Brown
10b *Pin*, 1950. (Closed position)
11 *Pin*, 1950. Sterling silver and white gold with amber, coral, malachite, onyx and moss agate. Photo: Peter Brown

12a *Pin*, 1947-50. Sterling silver with coral and malachite (open position). Collection: American Craft Museum, New York. Photo: Peter Brown
12b *Pin*, 1947-50. (Closed position)
13 *Pin*, 1960. Sterling silver with beach stones and turquoise inlay. Collection: Eugene Bielawski. Photo: Peter Brown



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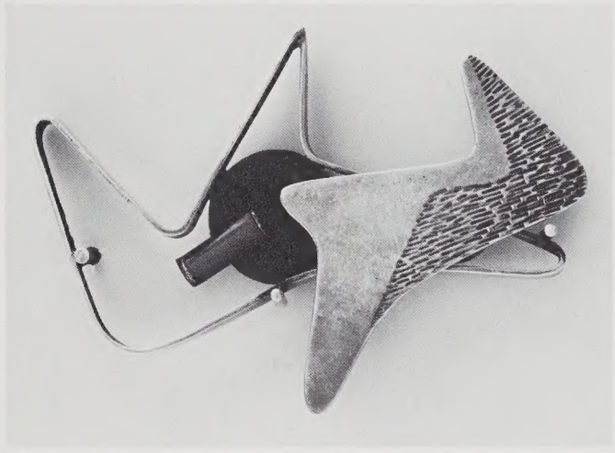

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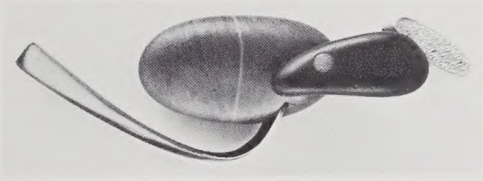

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dence over earlier explorations.

Not only was De Patta in harmony with the Constructivist design philosophy of the Bauhaus but the social philosophy as well: "By 1946 the demand for her work was far exceeding the supply, thus forcing her prices upward until her work was available only to those who could afford luxury prices. This created conflicts for her; 'For quite some time,' she wrote, 'I had become aware of the contradictions between my social viewpoints and my method of work.'

"Being the conscientious individual she was, it pained her to negate the Bauhaus philosophy of social integration [by treating pure and applied art with parity] and she and her husband began to devote much thought to production methods for the craftsman.

" 'It seems to me that a creative artist has a social responsibility to produce not the single highly priced handmade article for the extremely limited consumption,' she stated, 'but to produce the best possible in design, workmanship, and materials to give pleasure to the largest number of people possible.' "[9]

In 1958, after approximately 12 years of production work, De Patta and her husband decided to discontinue production, although they had proved that high-quality jewelry of original design could be produced by the method of lost-wax casting and marketed successfully. However, the consuming nature of design, manufacture, marketing, delivery and so on was overwhelming. Whether this commitment to the social responsibility of the artist that Margaret De Patta so keenly felt had less impact because of her involvement with her business is a question for speculation. Possibly, if she had been continuously affiliated with a good school or program, she might have produced a body of students who could have taught and shared her beliefs with others.

De Patta began her career at a pivotal time for American crafts, when the field as we know it today did not exist. She was one of the American artists who joined with European emigres to develop a standard of excellence in both design and technique. In light of recent studio jewelry marketing developments, her vision of the need to expand the scope of handwrought jewelry brings even greater significance to her years of production design work. She was a pioneer in the fullest sense of the word.

In sum, Margaret De Patta was a lone voice in the jewelry and metalsmithing field between 1930 and 1945, who sensed the importance of pure structure and the beauty of spatial control in wearable pieces. She pioneered in the use and control of light both on the surface of and within her pieces. Her experimentation and play in the late 1940s and early 1950s with mechanisms and movable parts in jewelry were ideas that were just beginning to be widely explored in the late 1960s and early 1970s by contemporary jewelers and metalsmiths. A major source for her work and concepts was Moholy-Nagy and his Bauhaus Constructivist theories, but it was De Patta who was the master of floating stone settings and optically cut stones and crystals. Her manipulation of light through and upon surfaces also included screen and punched holes to allow light to articulate itself in other ways. Her daring architectural but wearable pieces of jewelry are as fresh and important today as they were nearly 30 years ago when they were conceived and made. ■

Notes
1. *The Jewelry of Margaret De Patta: A Retrospective Exhibition,* February 3-March 28, 1976, The Oakland Museum, catalog: "Margaret De Patta," Yoshiko Uchida, p.12
2. Ibid., *"Margaret De Patta—An Analysis of Her Work in Jewelry,"* Eugene Bielawski, p.27
3. Ibid., Uchida, p.12
4. Margaret De Patta, miscellaneous papers, undated
5. Ibid.
6. Op. cit., Bielawski, p.15
7. Margaret De Patta, "From the Inside," *Palette,* Spring, 1952, pp.16-17
8. Op. cit., Uchida, p.16
9. Ibid., Uchida, p.17

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De Patta, Margaret. "From the Inside," *Palette,* Spring, 1952, pp.14-19
The Jewelry of Margaret De Patta: A Retrospective Exhibition, February 3-March 28, 1976, Oaks Gallery, The Oakland Museum, catalog: "Introduction," Hazel Bray, curator of the exhibition; "Margaret De Patta," Yoshiko Uchida; "Margaret De Patta —An Analysis of Her Work in Jewelry," Eugene Bielawski
Moholy-Nagy, exhibition catalog published by the Museum of Contemporary Art, Chicago, IL and the Solomon R. Guggenheim Museum, New York, 1969

by Ann Grundler

A Metalsmith's Guide to ***Northern California***

Ann Grundler is an independent jeweler who lives and works in Castro Valley.

Golden Gate Bridge in the fog. Photo: Sue Ritzau

The choice of San Francisco's Bay Area for this guide was prompted by the location of the June, 1983, Society of North American Goldsmiths' annual conference at the Asilomar Conference Grounds in Pacific Grove on the Monterey Peninsula. The original buildings at Asilomar were designed by Julia Morgan, a noted California architect. The surrounding scenery—cypress trees, dunes, rocks and oceans—creates an atmosphere unique to the California coast and especially to the Peninsula. Only a few miles south of Pacific Grove are spectacular views at Point Lobos Reserve.

View from a trail on Point Lobos Reserve, Monterey Peninsula. Photo: Ann Grundler

Carmel Between Pacific Grove and Point Lobos Reserve is Carmel, an ocean-side village which attracts both residents and visitors who support many fine local jewelers. There are probably 40 in the town who earn their living producing their own work, as well as several highly skilled benchworkers who do repair and custom work for retail stores. Metalsmith Douglas Steakley, owner of Concepts gallery, says "I know of no other small city, including Sausalito, where there are so many working jewelers." Besides Steakley, other outstanding jewelers have opened their own retail stores, including Goph Albitz, Jean Pierre Brandt, Henri Corbat, Ron Hentges, Rich Shea (Carmel Valley), Tom Gregg and Michael Sherman. Susan Kingsley and Robin Casady show at the Ivory Works (Doud Arcade on Ocean Avenue) with jeweler Richard Vielle. Aleris Zeitler and Carol Holaday sell at Concepts (6th and Mission), considered by many to be the finest gallery for contemporary metalsmithing. From May 29 through June 30, 1983, "New Holloware" by John Marshall will be shown here.

Two free publications *Coasting* and *The Pine Cone* are available in many stores; they include information about the area and all the art galleries. The Monterey Peninsula Museum of Art will show "New Directions by California Jewelers" during June—the opening reception is Friday evening, June 10. At the same time the winning pieces from the Johnson Matthey Platinum Design competition will be on view.

Douglas Steakley, *Container,* copper with 14k gold, 8 x 5". Photo: Lee Hocker. Concepts Gallery

Santa Cruz Area If you travel north on Coastal Highway 1, you approach the sandy beaches of Santa Cruz Bay. Here, the warmest beaches in Northern California attract surfers and sailors. Many craftsmen live here but sell elsewhere, as the market is inadequate to support the best work. There are some nice craft shops in Capitola on Capitola Avenue just a block behind the beach. Some of the finest work in glass and wood and some jewelry is shown at Camelean Designs (107 Capitola Avenue). A few miles north in Santa Cruz, the best craft work, including jewelry, is exhibited at the Santa Cruz Art Center (1001 Center Street). Art-oriented shops can be found a block over on Cedar Street. Metalsmiths John and Merry Lee Howell, known for their cloisonné, live there (telephone: 408/426-9286); and knifemaker and author David Boye lives 10 miles north in Davenport (408/426-6046).

Alan Revere, *Rings and Bracelet,* gold, diamonds, ivory.

Los Gatos Traveling north on Highway 17 over the Santa Cruz Mountains you come to the idyllic little town of Los Gatos. In the section of Old Town you will find many antique shops, craft shops and galleries. Precious Objects Gallery (29½ N. Santa Cruz Avenue), owned by Mitsuko Cambe and Walter Soellner, specializes in gold handcrafted jewelry. During June, 1983 they will sponsor their "Third Annual Wedding Ring Show," with the work of about 35 jewelers from across the United States. Also in Los Gatos, Strictly Upper Crust, displays the finest selection of blown-glass table lamps I have seen, as well as other crafts.

View of downtown San Francisco from Telegraph Hill. Photo: Dan Casey

San Francisco San Francisco is indeed an exciting city, offering a wide range of shops and exhibits of potential interest to the metalsmith. Contemporary Artisans (530 Bush Street) is a top-ranking crafts gallery. Elaine Potter shows the most unusual and exquisite glass, ceramics, fiber, paper and metal. She has organized the best jewelry shows in town in the last few years and always has some jewelry on display. During June she will show, "The Gold Exchange," comprised of European, mostly German, contemporary jewelers. Judging by the response from the exhibiting artists, I expect it will be the finest and largest presentation of German goldsmithing on this continent.

Kurt NeuKomm, *Konterfei,* slate relief with gold brooch and diamonds, 30 x 30 cm, Contemporary Artisans Gallery

Monterey Peninsula

Asilomar Conference Grounds, Pacific Grove, *Society of North American Goldsmiths' Annual Conference,* June 8-12

Monterey Peninsula Museum of Art, Carmel, *New Directions* by California Jewelers and Johnson Matthey *Platinum Design Competition winners,* opens June 10

Los Gatos

Precious Objects Gallery, *Third Annual Wedding Ring Show,* June

San Francisco

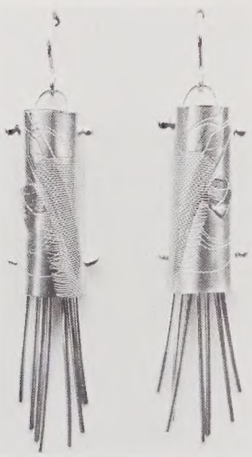
Contemporary Artisans, *The Gold Exchange,* June

Revere Academy of Jewelry Arts, *open house,* June 12 and 13

Union Street Goldsmiths, *commissioned work,* June

Oakland

Oakland Museum, *a showing of jewelry from their Margaret De Patta Memorial Collection, June*



Ann Grundler, *Earrings,* sterling silver, 24k gold, 2" l., Contemporary Artisans Gallery

Included will be Klaus Ullrich, Bernd Munsteiner, Ehinger-Schwarz, Kurt Neukom from Switzerland and Christophe Burger from France. Close by (228 Grant Street) are three of the most avant-garde galleries in town. Several of the better jewelers are on Post and Sutter Streets. Three have extensive collections of antique jewelry; Stewart's (580 Sutter Street) features Russian enamels and work by Fabergé; Antoinette's (276 Post Street) has the most unusual art nouveau and art deco jewelry, from the Victorian and Georgian period; besides jewelry, J.M. Lang has a good collection of art objects. Jewelry designed by Erté is on display at the Owl Gallery (465 Powell Street). Harry Fireside (219 Sutter Street) combines huge tourmaline beads, pearls, recycled stones and objects with precious metal in his unique, fashionable, ostentacious necklaces, earrings and belts. St. Eligius—European Goldsmiths (521 Sutter Street) specializes in custom-designed jewelry. Working from renderings approved by the customer, they cast or fabricate, using various colors of gold and precious stones. They have mastered all traditional goldsmithing techniques including granulation. There is always some outstanding work on display and you can look through to the back to see their well-designed workshop. Theodora, a goldsmith, who just relocated in the Crocker Galeria (50 Post Street), specializes in well-designed jewelry, including handcrafted, fashion and manufactured jewelry in contemporary European styles.

A wholesale complex in downtown is the Showplace (2 Kansas Street). On the mezzanine all the wholesalers are in the jewelry business, offering chains, stones, beads, jewelry and other supplies and imports. After being admitted with your business card you can browse from door to door. The more serious jeweler can find supplies in the Phelan Building (760 Market Street). Here you have to ring each door bell for admission and you must know what you are looking for. Three European-trained goldsmiths—McBride, Abrasha and Alan Revere—each have their studios/suites in this building. The Revere Academy of Jewelry Arts (Suite 937, 415/391-4179) will offer eight post-conference workshops, June 13-19 taught by eight specialists in their fields, including Edward deLarge, Patty Daunis-Dunning, David LaPlantz and Tim McCreight. Michel Roysten will teach "Forging Jewelry Forms;" Alan Revere will hold an open house June 12-13.

In the northern part of town several goldsmiths have shops on Union Street. Glenda Queen—Union Street Goldsmiths (1763 Union Street) has the largest display of contemporary handcrafted gold jewelry in town. Goldsmiths Carrie Adell, Linda Weiss, Michael Ross, Susan Pasdera, Jan Simon, Mark Wilner and Jerry Spaulding have work continuously on display. A local goldsmith with her own outlet is Heidrun von Buschow (423A Locust Street), who creates large gold jewelry, true sculptures, in metal and gemstones. She will show additional commissioned work during June.

Golden Gate Park has some permanent collections of potential interest to the metalsmith. In the California Academy of Sciences (415/221-4214) a large display of antique timepieces is situated in front of the planetarium. In the western part of the complex is a large selection of mineral specimens and gems. Across the Music Concourse the annex to the M.H. De Young Memorial Museum, now the Asian Art Museum (415/558-2993), houses the Avery Brundage Collection, the largest and most important collection of Chinese art outside China. It includes metal vessels, objects and elegant carvings in the Jade Room. Goldsmiths might also be interested in visiting the Old Mint (55 Mint Street, 415/974-0780). The museum has gold bars, nuggets and coins on display, as well as tools, dies and so on.

Oakland You can take a BART train across the bay to visit the Oakland Museum (1000 Oak Street, 415/834-2413 or 27 3-3401). This museum is regional in scope, featuring the art, history and natural sciences of California in its permanent collection. The building is modern and a most pleasant place to learn about the state. During June, the crafts section will feature an enlarged selection of jewelry by Margaret De Patta. A noted mid-century pioneer in the crafts revival, De Patta was active from 1929 until her death in 1964. Her special talents in design were instrumental in the remarkable growth of modern jewelry and its break with traditional forms and ideas of ornamentation. Based upon Bauhaus concepts of structure, design and the inherent qualities of materials, her use of transparent stones and manipula-

tion of light is particularly noteworthy. The work on exhibit will include pendants, pins and rings drawn from more than 70 pieces in the Museum's Margaret De Patta Memorial Collection. There is also jewelry by California artists continuously on display in the crafts section. More handcrafted jewelry of uneven quality is on display and for sale at the Collectors' Gallery and the Museum Shop.

Further North, in Berkeley, is the Art Co-Op (1652 Shattuck Avenue), noteworthy for its outstanding business success.

Sausalito and Mill Valley Across Golden Gate Bridge in the north, Sausalito clings to the hill with a spectacular view of the bay. It has a reputation for its goldsmiths, most of whom are located along Bridgeway and Princess Streets. One of the best is John David Stanton on Bridgeway. My favorite is David Hurley (30 Princess Street, in the Court). He carries exquisitely crafted jewelry, mostly in gold, with unusual stones. Jerry Spaulding (at the corner of the Court, upstairs) does handsome designs with flush-set stones. The finest crafts can be found at the Quest Collection (687 Bridgeway) and the Quest of Sausalito (795 Bridgeway), including jewelry in a variety of media. One of the most reputable goldsmiths in the Bay Area, George McLean escaped the constant flow of tourist traffic in Sausalito and moved a few miles north to Mill Valley (16 Madrona Street). He has a pleasant, modern store and studio here. He does mostly custom work and has the work of other goldsmiths on display. The best contemporary crafts in the center of this wealthy town are shown at Horizon Gallery (32B Miller Avenue).

Revere Academy of Jewelry Arts, San Francisco. Photo: Eric Luse

Mendocino North of San Francisco, some 150 miles, stretches the Mendocino Coast with high bluffs and deep gulches. The community of Mendocino is not unlike the Monterey Peninsula, but locals will soon point out it is not (yet) as commercially exploited, retaining its rustic atmosphere. When I drove there this summer, through the redwoods with visitors from Germany, they could not believe that such fine-quality crafts could be hiding here. Gallery Faire (Kasten and Ukia Streets) is the largest and carries the best of fine arts and crafts, displayed on two stories. Bill and Lynette Zimmer especially appreciate finely crafted wood, but are equally choosy in selecting their ceramics, glass, jewelry and fibers, including clothing; they also show paintings and bronze sculptures. Temptations (10466 Lansing Street) specializes in jewelry and art glass. They have a large selection of unique jewelry by well-known artists. Le Voyage (Albion Street) carrries ceramics and jewelry of a very personal style. You will find more shops and galleries in town. An important influence is the Mendocino Art Center (45200 Little Lake Street). It holds one- and two-week classes in design and most craft media, has a cosy theater and its gallery displays and sells the work of many local artists. It also publishes *A & E,* a guide to the arts and entertainment. If you plan to spend some time in any of the communities described here, I suggest you write six to eight weeks before you leave to the Chamber of Commerce requesting information, such as maps and tourist publications. More events and shows of interest to the metalsmith and artist during June have not yet been announced as we go to press. For example, the California Crafts Museum would like to have a fashion show with jewelry, but it has not yet found a new location for the museum. However, I hope this overview will whet your appetite to explore the riches of the central California coast. ■

A typical Pacific Heights residential street. Photo: Dan Casey

Metalsmithing in the 1940s and 1950s
A Personal Recollection

by Arthur J. Pulos

The following is a paper presented by Arthur Pulos at the September, 1982 research conference, "American Metalsmithing and Jewelry in the 1940s and 50s," which was sponsored by the Renwick Gallery, The Archives of American Art, the Smithsonian Institution, Boston University's Program in Artisanry and Metalsmith *magazine.*

The assignment that I have been given is to review early metal programs. However, I can cover the subject best by relating it to my own experience. Whatever I miss will certainly be explored by others at this seminar.

First of all, I should put the comments that follow into some perspective. I am not convinced as many others are that there were craftsmen in the colonies. As I see it, they were really industrialists—using the most advanced tools and processes available to them to make whatever would suit their clients with the least amount of energy and time. The romance attached to their work is in us, not them.

Let me now jump quickly through a century to the arts and crafts movement in this country. Certainly it was characterized by a romantic desire to go back to a simpler life—without machines. However, William Morris, the acknowledged master of the movement, was not against the machine—only its abuse and the abuse by management of those who worked with machines. And while Gustave Stickley and Elbert Hubbard and others preached the craft of what they were doing as a search for honesty in material, method and purpose, they were, in reality, protesting the false promises of manufactured ornament. They were, furthermore, manufacturers—employing others to create and market their products. Their ultimate failure is best characterized by Sigfried Giedion's statement that with the bankruptcy of Stickley in 1916 the Arts and Crafts Movement in America had become a hobby rather than a religion.

In 1920 Charles Richards was commissioned by the Federal and New York State governments to make a study of industrial arts education and the industrial arts industries in the United States. We tend to use the terms industrial arts, decorative arts and applied arts interchangeably to identify those products that are made for personal or proximal use. He reported that 58 schools were listed by the *American Art Annual* as offering courses in the applied and industrial arts. However, the graduates of those schools were no more interested in working in the industrial arts industries than the industries themselves were in employing them. The furniture industry, for example, was afraid that American designers would want them to manufacture original designs rather than replicate traditional ones. And silverware manufacturers were quick to point out that the high capitalization of the tools and dies of manufacture discouraged innovative design.

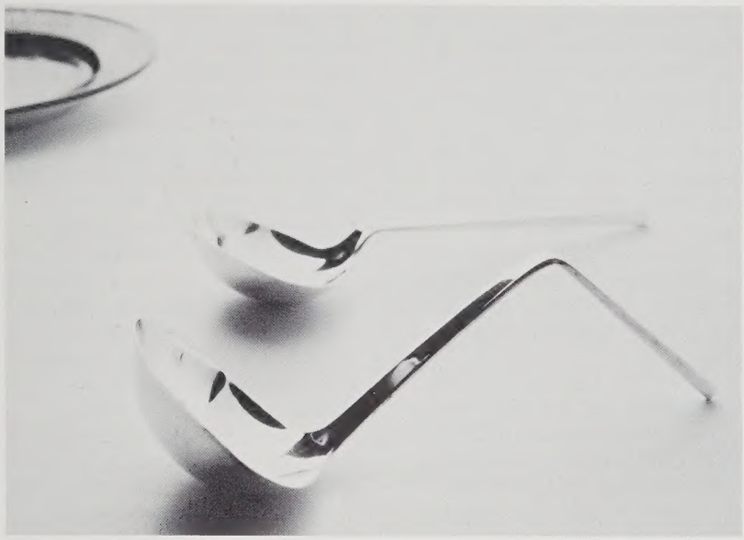
Over the years it has been acknowledged that Americans will not support design education so long as the objects to be copied as well as designers and craftsmen can be imported from other countries. In fact, it wasn't until the embarrassed reluctance of American industrial arts manufacturers to participate in the great 1925 Exposition of Decorative Arts in Paris because they could not comply with the stipulation that only original work should be shown that Herbert Hoover, as Secretary of Commerce, felt obliged to decline the invitation from the French. It was then that repeated pleas for formal education in design in the United States began to bear fruit. Industrial arts products from Sweden made a grand sweep of the major awards, providing the momentum that gave Scandinavia preeminence in the industrial arts for decades to come. In the aftermath of the exposition, what has come to be known as Art Deco rekindled a momentum for industrial arts design and manufacture in this country, only to be brought to an abrupt halt by World War II.

For a much better overview than I have time for here, let me refer you to Rose Slivka's perceptive article in the 1959 issue of *Craft Horizons* entitled "United States Crafts in this Industrial Society." It covers more than I can do by pulling at the threads of my fading memory. Nevertheless, I will try to add a little personal embroidery to the fabric that she has woven so soundly. It is most important that we should explore the immediate post-war decades in greater detail, because that was the period when American crafts flourished just before the turbulent Sixties.

The impetus for the surge in American crafts and the changes that were inevitable were contained in the contrapuntal philosophies espoused by the American Craftsmen's Cooperative Council, established

Over the years it has been acknowledged that Americans will not support design education so long as the objects to be copied as well as designers and craftsmen can be imported from other countries

Arthur J. Pulos, FIDSA, is president of Pulos Design Associates in Syracuse, NY and an officer of the International Council of Societies of Industrial Design. In 1983 he will travel to Osaka, Japan to both jury and present the keynote speech at the First International Design Competition.



Top *Ladles,* sterling silver. Private Collection. **Above** *Salad Set,* sterling silver. Private Collection

in 1938, later, in 1943, renamed the American Craftsmen's Educational Council. As early as 1945 a majority of the some 25 craft groups affiliated with ACECA were, in effect, arts and crafts societies, such as the League of New Hampshire Craftsmen and the Southern Highlands Guild. Their commitment at the time was either avocational or had shifted to a new cause: to provide morale-building experiences through the crafts for those in service and, in particular, therapy through crafts for those veterans who were physically or mentally disabled. However worthy, the intentions of the arts and crafts groups were, it became quite evident that the quality of the product was not as important as the effect of the experience on the participant. In fact, it was suggested that the patient should be exhibited rather than his product.

In contrast to interest in the crafts for avocational or therapeutic purposes, there was a growing band of Americans and emigrees who were earning their living through one craft medium or another. They were already organized into small groups of professional craftsmen, meeting from time to time to exchange technical and marketing experiences. The shift towards their interest came into prominence in 1945 when the Rehabilitation Training Program at Dartmouth that was sponsored by the American Craftsmen's Educational Council was renamed the School for American Craftsmen and moved within a year to become part of the Fine and Hand Arts Division of Alfred University. In a short time Harold Brennan, who had replaced Herbert Sanders as director, found a permanent home for the school at the Rochester Institute of Technology. With the appointment of the talented Dane, John Prip, as head of the silversmithing program, it was inevitable that the school had set a professional course for itself.

The third philosophical justification for the crafts that had been proposed by the ACC was a personal commitment to esthetic expression. Although it was still contained by the layers of avocational and professional crafts, it was developing the force that would enable it to break through to the top in another decade or so. The dark specter of industrial design, largely ignored by others, lurked in the shadows.

My first awareness of the crafts came in the late 1930s when, as an undergraduate at the Carnegie Institute of Technology in Pittsburgh, I was introduced to the conflict of values that faces those who are interested in conceiving and making objects that will be as satisfying and useful to others as they are to themselves.

I will presume that many other students were, like me, required to take courses in the crafts in which the goal seems, in retrospect, to have been the preservation of traditional techniques and, at the same time, encouragement to build barricades against an onrushing technology. With them I went through a series of exercises in basketweaving, bookbinding, leatherwork, clay pots and tiles, and copper, brass and pewter knicknacks for familiarization with basic techniques that were presumed to be appropriate for classroom parrotting.

One of my courses, however, was taught by Frederick Clayter, who was clearly more devoted to the art and science of metalsmithing and jewelry as ends in themselves rather than means. He insisted on a quality of design and execution that was well beyond that needed for academic, recreational or therapeutic purpose. My eyes and hands sharpened their abilities and I fell in love with what they made for me. Fred Clayter sealed my fate by giving me a set of basic metalsmithing tools when I left Carnegie.

I must also acknowledge the fact that my most challenging experiences as an undergraduate were with a variety of design assignments that were less concerned with technique and expression than they were with the effect that their resolution would have on others. One of the two teachers who taught these courses as part of the pioneering program in Industrial Design at Carnegie was Alexander Kostellow, who went on to Pratt Institute to build the strongest ID program of the post-war years. The other was Peter Mueller-Munk who had been educated in philosophy at the University of Berlin followed by training as a silversmith under Waldemar Raemisch. Peter came to the U.S. in the late 1920s and set up and practiced silversmithing in New York City before joining the faculty in Industrial Design at Carnegie. Later he resigned his position to establish a successful practice of industrial design in Pittsburgh. I might also add that Edwin Scheier, the potter, once told me that he served as a hammerman for Peter in New York City, pounding out silver

My first teaching position at the University of Illinois included drawing and design assignments and, in particular, teaching craft courses that were justified primarily as service courses for the Occupational Therapy program in another college

Above *Compote,* sterling silver. Private Collection. **Right** *Beverage Server,* sterling silver. Shown at the American Pavilion at the Brussels World's Fair

for him in the back room while Peter dealt with his clients in the front. Silverware by Peter was shown in the 1929 Exhibition of Modern Interiors Designed by Architects at The Metropolitan Museum of Art. In 1957 Peter was elected to serve as the first President of the International Council of Societies of Industrial Design, and I am proud to note that in 1980 I was elected to follow in his footsteps.

After Carnegie, as a graduate student and teaching assistant at the University of Oregon from 1939 to 1941 I continued to walk the sharp edge between professional crafts and industrial design while earning a Master of Fine Arts degree with a thesis in ecclesiastical silver. I should add that since there was no program in silversmithing at Oregon at the time, I managed to teach myself from such publications as were available and from examination of products during field research.

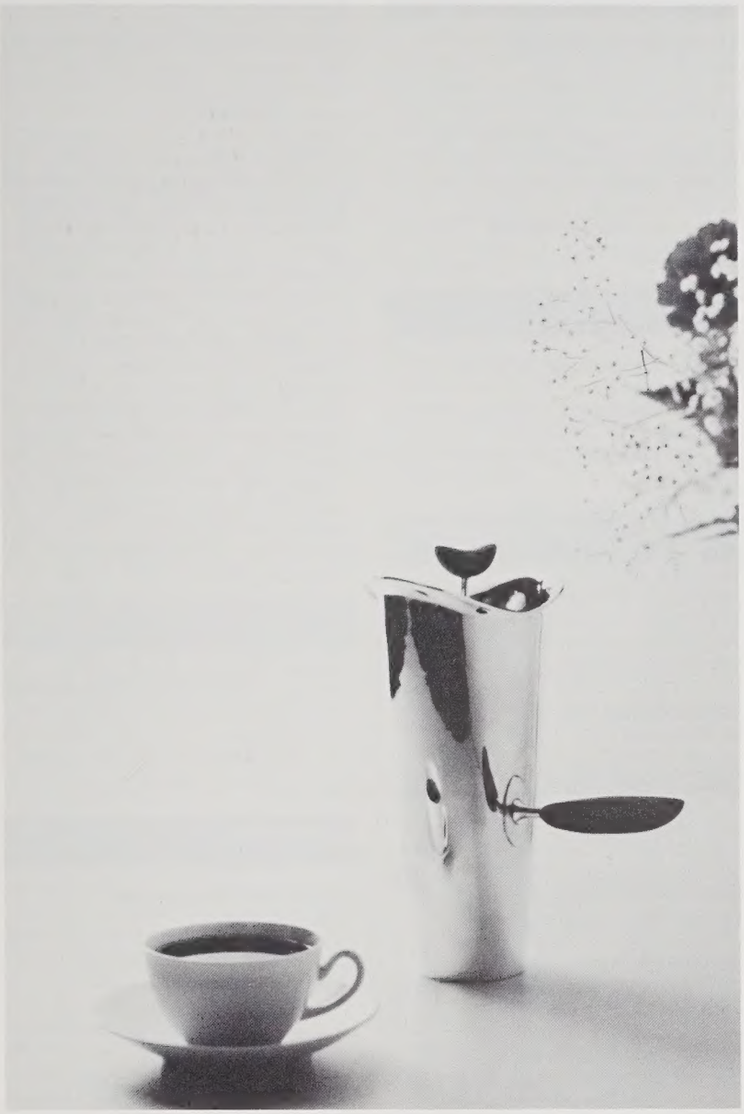
While at Oregon I became acquainted with Lydia Herrick Hodge and others at the Oregon Ceramic Studio that was just being built in Portland. I designed the logotype and helped to build the walk-in kiln for the studio over a profitable summer. I also found time to design ecclesiastical light fixtures for the architect Pietro Bellushi who was working in the Northwest at the time.

From Oregon, after a concentrated course in aircraft metalwork for the Boeing Aircraft Company, I was assigned to teach metalwork as a civilian at Chanute Field, Illinois and later as chief of the Aircraft Metalwork program in the training program for Air Force officers at Yale University. After induction and commissioning as an officer, I was sent to Europe a few months after the war ended, first assigned to the Troop Carrier Command in charge of aircraft metal maintenance and later as an Information and Education officer for the Air Forces. At the same time, while I was in the London area, I spent every hour that I could in the Victoria and Albert Museum absorbing the craft and design of metalwork. And on the several occasions that I was in Paris, I visited the atelier of J. Puiforcat, an important silversmith who had been, among other things, a teacher of Georg Jensen. Puiforcat had made a reputation for himself by reproducing historic French masterpieces in silver using the same techniques as the originals. So, in a sense, his pieces were logical replications of the original. His son, Jean, however, had become interested in modern design and dynamic symmetry and had produced a number of excellent pieces of modern silverware before he died suddenly in Mexico where he had been trapped by the war in Europe.

When I was discharged from the Air Forces in 1946, I began to replay the same themes that I had experienced as a student. My first teaching position at the University of Illinois included drawing and design assignments and, in particular, teaching craft courses that were justified primarily as service courses for the Occupational Therapy program in another college. It was as difficult at the time, as it may still be, to justify craft courses in academic departments that are under control of the Fine Arts. However, courses directed at the rehabilitation of servicemen seemed at the time to be a noble cause that Fine Arts administrators could lean on for institutional support. By playing on this theme I was able to acquire space and tools and machines for the ceramic and metal workshops and to design and have built appropriate workbenches and special equipment. The program was eventually built up to a point where I could leave it in clear conscience to Robert von Neumann when I moved on to Syracuse University.

Over a period of eight years at Illinois, I was part of the general shift across the country from therapeutic and recreational to professional crafts education, with my own specialization increasingly focused on silversmithing and jewelry. Of particular importance to me was the opportunity to participate in one of the Handy & Harman Silversmithing Workshop Conferences that had been conceived by Margret Craver. Her perceptive contribution to the development of excellence in silversmithing was invaluable to me.

In 1952 I was fortunate enough to be selected as a Ford Fellow and used the sabbatical that gave me to study colonial and contemporary silversmithing techniques in New England. I went over as many of the papers and inventories of colonial smiths as I could find and made detailed structural drawings of over 60 pieces of important colonial silver in Boston, New Haven, New York, Philadelphia, Cleveland and Chicago. Along the line I was invited to serve as a consultant in the reconstruction of the Golden Ball, a silversmith's shop



I am a member of that small minority of craftsmen who left the fold to become designers for industry

at Colonial Williamsburg. In the process I reconditioned a set of 18th-century English silversmithing tools and set up and demonstrated colonial practices in silversmithing. (Selection from this study of colonial silver and drawings will appear in a future issue of *Metalsmith*, while a publisher is sought for the entire set.)

I should also mention that during my stay at Illinois, I joined a group of architects in a firm called Creative Buildings that was developing and building prefabricated churches across the country and at radar stations for the military. I was responsible for the design and contract manufacture of all of the metal furnishings for the churches, ranging from hardware and lighting fixtures to altar appointments.

I must also mention that I had been preceded at Illinois by another silversmith, Hudson Roysher, who had come from the Cleveland Institute of Art in 1938 to set up the Industrial Design program. Subsequently he left to teach a program that combined industrial design and silversmithing at Chouinard Institute in California. The two disciplines seem at times to be indispensible to one another. Therefore, I am not surprised to learn that both Fred Miller and John Paul Miller began in industrial design and then shifted to silversmithing and jewelry.

In the mad rush to forget the war, crafts for therapy soon fell behind in the race to create beautiful things for the new homes of the post-war era. "Good Design" exhibitions and competitions and so-called "Contemporary" shops to market the products that they stimulated sprang up across the country, and I, with many of my contemporaries, vied for the recognition and rewards that they promised. For a while I was privileged to be one of this small band of silversmiths, most of whom were subsidized by an academic position. This made it possible for us to take on commissions for unique products or to indulge in the limited production of articles for sale, usually on consignment, in the contemporary shops such as America House in New York, Baldwin-Kingrey in Chicago and Amberg-Hirth in San Francisco.

For a while we seemed to survive in the netherworld between silversmithing and industrial design. We managed to stay on the right side of the banner of the American Craftsmen's Council by not joining established industries in our field who, in retrospect, needed our services desperately, but with whom we had very little in common. Despite the well-meaning commitment to the craft by Handy & Harman, the interest of other industries was clearly motivated by using the unique works that were being produced to promote their own wares. Only in rare cases did our work enter the mainstream of industry, and then only briefly.

Since the 1950s, a number of our contemporaries have, by virtue of their talent and the quality of their expression, moved on to become fully committed artists with their products sought by the best galleries for purchase by the most astute collectors. In turn, they have stimulated a new generation of artists in metalsmithing and other media.

I am a member of that small minority of craftsmen who left the fold to become designers for industry. In all of my endeavors I have found invaluable the discipline of method and absolute control of form demanded of the silversmith and commend it to anyone who would be a designer. ■

Metalsmith **Summer Programs 1983**

This is our third annual summer workshop listing of courses in metalsmithing, jewelry and related fields. As we go to press, much of the information given here is tentative or to-be-scheduled. Therefore, do write or call for verification of workshop themes, instructors and dates. Because enrollment is limited in many programs, we suggest you make reservations early.

Metalsmith *encourages schools, universities, museums and private instructors to send information for next year's listings as soon as it becomes available. Deadline for submission of listings for 1984 is December 15, 1983. Send information to: Sarah Bodine, Editor,* Metalsmith, *1 Penn Lyle Rd., Princeton Junction, NJ 08550.*

We hope this section will be of help to those interested in pursuing studies in metalworking over the summer.

Creative Arts Workshop, Connecticut

Arizona

University of Arizona
Art Dept.
Tucson, AZ 85721
Michael Croft
Summer Program: May 16-28.
Accredited courses in: Blade Forms in Steel; Cutting Edges and Toolmaking
Instructor: Michael Croft
Accommodations: Dorms

California

California College of Arts and Crafts
5212 Broadway at College
Oakland, CA 94618
Telephone: (415) 653-8118
Ellen Jouret,
Dean Extended Studies
Summer Program:
July 25-August 25.
One five-week class in Introduction to Jewelry and Metal Arts.
Instructor: Florence Resnikoff
Accommodations: Limited dormitory space

Gemological Institute of America
Jewelry Arts Dept.
1660 Stewart Street
Santa Monica, CA 90405
Telephone: (213) 829-2991
Zavella Jacobson, Office Manager
Summer Program: May 9-June 24 and July 11-August 26, Jewelry Design Resident Program;
June 6-July 22, Hand Engraving Resident Program. Additional one- and two-week classes given in Santa Monica and "on the road; in Jewelry Repair, Basic Stone Setting, Advanced Stone Setting, Jewelry Design, Wax Carving and Lost Wax Casting, and Gem Cutting
Accommodations: Available; call Bonnie Saito, Supervisor, Student Services Dept.

Laguna Beach School of Art
2222 Laguna Canyon Road
Laguna Beach, CA 92651
Telephone: (714) 497-3309
Sue Darrow, Registrar
Summer Program:
June 20-August 27.
Basic and advanced classes in enameling and jewelry
Instructors: Correen Kaufman and Molly McGuire
Accommodations: Hotels and motels in area

Jewelry Tech Institute
7271 Garden Grove Blvd., Suite F
Garden Grove, CA 92641
Telephone: (714) 897-0935 or 0930
Marilyn Ravanal
Summer Program: July-August.
Two-week daytime sessions and part-time evening sessions in Beginning Goldsmithing, Casting, Beginning Faceting, Beginning Wax Technqiues, History of Jewelry, Hand Engraving, and Beginning Colored Stones
Instructors: Teri Brudnak, Jurgen Maerz, John Rouse, Julia Howden, and Jerald R. Syme
Accommodations: Hotels and motels in area

Revere Academy of Jewelry Arts
760 Market Street, Suite 937
San Francisco, CA 94102
Telephone: (415) 391-4179
Alan Revere, Director
Summer Program:
June 13-August 20.
One-day to eight-week sessions in Titanium, Niobium, Tantalum: Coloring and Manipulation; Married Metals; Metalmania; Mechanisms for Jewelry; Granulation, Reticulation and Fusion; Forging Jewelry Forms; Hydraulic Pressing for Jewelry; Refining Precious Metals; Hand Engraving; Jewelry Rendering; Advanced Rendering; Goldsmithing; Jewelry Repair; Stone Setting; Pavé Diamond Setting; Advanced Stone Setting; Comprehensive Setting; Super Setting I and II; Wax Techniques; Jewelry Casting; Rubber Mold Making; Diamond Grading; Colored Stones Identification
Instructors: Edward deLarge, Patty Daunis-Dunning, David LaPlantz, Tim McCreight, Alan Revere, Michel Royston, Dennis Toth, Frank Trozzo, Alf Ward, George McLean, Keith Bartel, Paul Christensen, Faith Spaulding, Celia Kuitunen, Si Frazier, and Annie Frazier
Accommodations: Hotels, motels, and residence halls in town

Colorado

Donconor Workshops
P.O. Box 17324
Denver, CO 80217
Telephone: (303) 295-0419
Harold O'Connor
Summer Program: July 11-22, Jewelry Techniques and Working Titanium
Instructor: Harold O'Connor
Accommodations: Shared condos or camping

Summervail Workshop Colorado Mountain College
P.O. Box 114
Vail, CO 81657
Telephone: (303) 827-5703
Susan Whitmore
Summer Program:
June 20-August 5.
Seven one-week workshops in metalsmithing with Gary Noffke, Mary Lee Hu, Fred Woell, Mike Croft, and others. Seven one-week workshops in enameling with June Schwarcz, Jamie Bennett, Martha Banyas, and others. Three one-week workshops in blacksmithing with Scott Friedenberg, Phil Baldwin, Don Williams, and others
Symposia: July 18-20.
Third Great Western Enameling Symposium with Bill Helwig, Pam Harlow, Oppi Untracht, and others.
July 21-23. 9th Annual Rocky Mountain Metalsmithing Symposium with Barry Merritt, Harlan Butt, Thelma Coles, Lane Coulter, and others
Accommodations: Local hotels and camping

Connecticut

Brookfield Craft Center
P.O. Box 122
Brookfield, CT 06804
Telephone: (203) 775-4526
Registrar
Summer Program: June-August. Week and weekend sessions in Blacksmithing, Enameling, Knifemaking, Toolmaking, Casting, and Pewterworking
Instructors: Alf Ward, Felicia Liban, John Heller, Elizabeth Garrison, and others
Accommodations: Hotels and motels in area

Creative Arts Workshop
80 Audubon Street
New Haven, CT 06511
Telephone: (203) 562-4927
Summer Program: July 5 and 7. Two three-hour sessions—brief Introduction to Metal Sculpture
Instructor: Ann P. Lehman

Illinois

Illinois State University
Dept. of Art
Normal, IL 61761
Telephone: (309) 438-2446 or 5621
Debra Lynn Gold
Summer Program: June 13-July 7. One four-week workshop in Advanced Surface Treatment, covering coloration and finishing, reticulation, niello, mokume-gane, and electroforming
Instructor: Debra Lynn Gold
Accommodations: Dorms

Southern Illinois University
School of Art
Carbondale, IL 62901
Patricia Beene Covington
Summer Program:
July 11-August 5, Advanced Metals; Special Problems; Independent Study
Instructors: L. Brent Kington and Richard Mawdsley
Accommodations: Dorms

Kansas

University of Kansas
Metalsmithing and Jewelry Design Dept.
Lawrence, KS 66045
Telephone: (913) 864-3074
Gary Nemchock, Dept. Head
Summer Program: June 6-July 29. Four- and eight-week courses in Basic and Advanced Enameling with Olli Valanne; Beginning and Advanced Metalsmithing with Jon Havener; and New Materials and Processes in Plastics and Electronics with Gary Nemchock
Accommodations: Dorms

Maine

Haystack Mountain School of Crafts
Box 87M, Deer Isle, ME 04627
Telephone: (207) 348-6946
Ethel Clifford
Summer Program:
June 12-September 9.
Two- and three-week sessions: June 12-24, Blacksmithing with Jim Wallace; June 26-July 15, Blacksmithing with Doug Wilson; Metalsmithing with Carol Kumata; July 17-29, Advanced Metalsmithing with Arline Fisch; July 31-August 19, Metalsmithing with Richard Mawdsley; August 21-September 9, Metalsmithing with Deborah Aguado
Accommodations: Double, triple, and dormitory rooms on campus

Portland School of Art
97 Spring St.
Portland, ME 04101
Telephone: (207) 775-3052
Leslie Bowman, Director of Admissions
Summer Program:
June 20-July 29.
Jewelry and Silversmithing
Instructor: Harold Schremmer
Accommodations: Hotels and motels in town

Massachusetts

School of the Museum of Fine Arts
230 The Fenway
Boston, MA 02115
Telephone: (617) 267-1219
Donald B. Grey
Summer Program:
June 27-August 5.
Metals workshops including silversmithing and jewelry making
Instructors: To be announced
Accommodations: Hotels in town

The Worcester Craft Center
25 Sagamore Rd.
Worcester, MA 01605
Telephone: (617) 753-8183
Tim McCreight
Summer Program:
July 5-August 4.
Afternoon and evening sessions two days a week in metalsmithing
Instructor: Tim McCreight
Accommodations: Hotels and motels in area

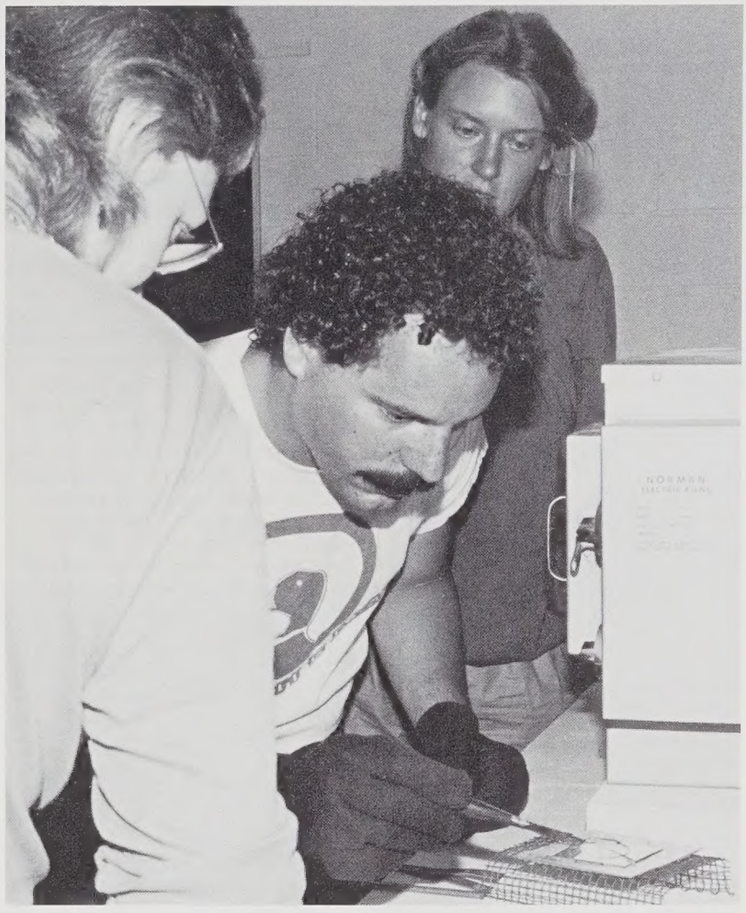
Montana

Montana State University
School of Art
Bozeman, MT 59717
Telephone: (406) 994-2952
Richard Helzer
Summer Program:
June 20-August 19.
Beginning Jewelry; Advanced Metalsmithing; Individual Study in Metals
Instructors: Richard Helzer and Al Gilmore
Accommodations: Residence halls

New Jersey

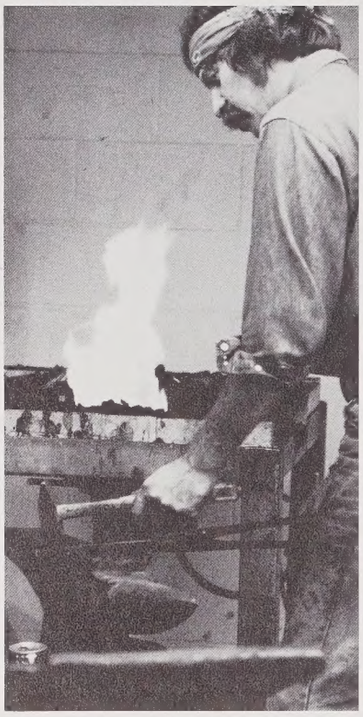
Peters Valley Craftsmen
Layton, NJ 07851
Telephone: (201) 948-5200
Sheila R. Stiven, Executive-Director
Summer Program: June-October. General Metalsmithing
Instructors: Resident craftsmen—Michael Lieber and Robert Davis
Accommodations: Limited accommodations available plus hotels and motels in area

Old Church Cultural Center School of Art
561 Piermont Rd.
Demarest, NJ 07627



Summervail Workshop, Colorado

Summervail Workshop, Colorado



Appalachian Center for Crafts, Tennessee

Telephone: (201) 767-7160
Ron Garofalo, Executive Director
Summer Program: June-July. Eight-week sessions in jewelry
Accommodations: Hotels and motels in area

New York

Craft Students League
YWCA
610 Lexington Ave.
New York, NY 10022
Telephone: (212) 755-4500, ext. 58
Summer Program: April-July. Over 30 six-to-15 week courses in Jewelry, Titanium Jewelry, Lost Wax Process, Enameling, Cloisonné, and Silversmithing
Instructors: Bill Seitz, Nathan Bell, Norma Zotos, Kineo Fukasawa, Tamiko Gerguson, Phebe Allen Blake, and Pedro Boregard
Accommodations: Hotels in town

Fashion Institute of Technology
Jewelry Design Dept.
227 West 27 St.
New York, NY 10001
Telephone: (212) 760-7648
Melvin Strump, Dept. Chairman
Summer Program: June 7-July 8. Daytime and evening classes in Studio Jewelry, Rendering, and Gemology
Accommodations: Hotels in town

Kulicke-Stark Academy of Jewelry Art
2231 Broadway
New York, NY 10024
Telephone: (212) 362-8633
Margot Bachmann
Summer Program: June 2-25, July 12-16, July 19-23, July 26-30. Four one-week workshops in Cloisonné Enameling, Chainmaking, Silversmithing, Granulation, Stone Setting, and Stone Cutting
Instructors: Jean R. Stark and others
Accommodations: Hotels in town

92nd Street Y Jewelry Department
92nd St. YM-YWHA
1395 Lexington Avenue
New York, NY 10028
Telephone: (212) 427-6000, ext. 162
Alison Howard Levy, Director
Summer Program: June 6-July 28. Four- and eight-day workshops in Jewelry for Fashion with Debra Fine Yohai; Designing with Titanium with Enid Kaplan; Silversmithing Techniques for Jewelry with Phebe Allen Blake; Enameling with Rebekah Laskin; Overlay and Marriage of Metal with Michael Lieber; and others. Also, eight weekly evening sessions in jewelry with David Tisdale and Mary Beth Rozkewicz.
Accommodations: Hotels in town

Parsons School of Design
66 Fifth Ave.
New York, NY 10012
Telephone: (212) 741-5795
Mary Ann Scherr, Chairman, Crafts Dept.
Summer Programs: Parsons in New York—June 13-July 21. One- and two-week sessions: June 13-16, Photo Silkscreen Etching with Mary Ann Scherr and Michael Kirk; Acrylics with Cora Croninger; Forming with Michael Lieber; June 20-23, Aluminum Anodizing with Tom Pignatelli; Beginning Jewelry with Pat Flynn; June 20-30, Beginning Jewelry with Pat Flynn; June 27-30, Aluminum Anodizing with David Tisdale; July 5-8, Metal Forming with Michael Lieber; July 11-14, Mokume-gane with Hiroko and Gene Pijanowski; Stone Setting with Deborah Aguado; Metal Engraving with Carlos Calona; July 18-21, Design and Production of Fashion Jewelry with Peter M; Electronic in Jewelry with Gary Daugherty; Metallurgy with Jamie Pelissier; also one four-week session, June 13-July 8, Beginning Jewelry with Deborah Aguado
Parsons at Lake Placid—June 26-August 19. Two-week sessions: June 26-July 8, Japanese Techniques with Hiroko and Gene Pijanowski; July 17-29, Surface Embellishments with Phillip Fike; July 31-August 5, Mixed Media with Mary Ann Scherr; August 7-19, Jewelry in Fashion with Robert Lee Morris
Parsons in Japan—July 20-August 27. General Cultural Information, Japanese Traditional Metal Techniques, including kebori and zogan, in Tokyo at Bunka Woman's University; travel to Kyoto to visit craftsmen's studios. Hiroko Swornik, Program Director
Accommodations: In New York—dorms and hotels in town; other programs, write for details

Rochester Institute of Technology
Summer School
1 Lomb Memorial Drive
Rochester, NY 14623
Telephone: (716) 475-2234
Summer Program: August 15-August 20. Jewelry with Lin Stanionis
Accommodations: Dorms

The Sculpture Center School
167 East 69 Street
New York, NY 10021
Telephone: (212) 737-9870
Gary Sussman, School Director
Summer Program: June-August. Workshops in Welding, Bronze Casting, and others
Instructors: J. Rackham, J. Snow, J. Larranaga, L. Landis, D. deCraft, and others
Accommodations: Hotels in town

Spring Street Enamels Gallery
171 Spring Street
New York, NY 10012
Telephone: (212) 431-8151
Summer Program: July 11-14, July 18-21, and July 25-28. Three workshops, which can be attended separately or continuously, in contemporary enameling, and traditional and contemporary cloisonné jewelry
Instructors: Joan Itzcovitz and Pamela McFarland
Accommodations: Hotels in town

Studio Jewelers Ltd.
32 East 31 Street
New York, NY 10016
Telephone: (212) 686-1944
Director of Admissions
Summer Program: June 6-August 27. Eight- and 12-week sessions in Basic Jewelry Construction, Wax Modeling Techniques, Lost Wax Casting, Rubber Mold Making, Stone Setting, Pavé Diamond Setting, Enameling, and Bead Stringing
Instructors: Robert Streppone, Patience Morgan, Larry Sultana, Donny Y Li, and Donna Sturm
Accommodations: Residence hotels, hostels downtown, and YMCA

Westchester Art Workshop
Westchester County Center
White Plains, NY 10607
Telephone: (914) 682-2481
Wayne Karpzinel, Director
Summer Program: May 16-June 24 and June 27-August 5. Two semesters of accredited courses in Jewelry; Lost Wax Casting; and Enameling
Instructors: Randey Gordon, Trudy Jeremias, and others
Accommodations: Hotels and motels in area

North Carolina

Haywood Technical College
Freelander Dr.
Clyde, NC 28721
Telephone: (704) 627-2821, ext. 264
Arch Gregory
Summer Program: July 5-September 21. Stone Setting, Inlay, Granulation, Niello, Mokume-gane, Titanium, Photoetching, Reticulation, Electroplating, Gilding, and Repoussé
Instructor: Arch Gregory
Accommodations: Motels and rentals

The John C. Campbell Folk School
Brasstown, NC 28902
Telephone: (704) 837-2775
John Bailey, Promotion Coordinator
Summer Program: May 1-September 17. One- and two-week sessions: May 1-14, Enameling with Maggie Masters; May 8-28, Blacksmithing with David Brewin; Jewelry with Tom Beaman; May 30-June 5, Beginning Blacksmithing with Paul Lundquist; Enameling with Renate Chernoff; July 3-16, Approaches to Architectural Ironwork with Ira DeKoven; Enameling with Tom Ellis; July 17-30, Blacksmithing with Robert Timberlake; July 31-August 13, Enameling with Dudley Culp; Jewelry with Tom Beaman; August 14-27, Enameling with Jeanne Garrison; Lost Wax Casting for Jewelry with Neil Garrison; September 4-17, Blacksmithing with Mark Bokenkamp and Peter Ross

Penland School of Crafts
Penland, NC 28765
Telephone: (704) 765-2359
Kathleen O'Reilly or Jo Vrana
Summer Program: May 30-September 9. Two- and three-week sessions in Blacksmithing, Metalsmithing, Enameling, Jewelry, and Sculpture, including fabrication, casting, stone setting, holloware, and surface embellishment

Accommodations: On campus room and board

Ohio

American Society for Metals
Metals Park, OH 44073
Telephone: (216) 338-5151
Ruth Zollinger, Director of Education
Summer Program:
May–September. Three-, four-, and five-day sessions, including Elements of Metallurgy, Metallographic Techniques, Heat Treatment of Steel, Principles of Heat Treating, and many others.
Accommodations: Holiday Inn nearby with transportation available

Kent State University
School of Art
Kent, OH 44242
Telephone: (216) 672-2192
Bruce Metcalf
Summer Program:
June 20–July 15.
One accredited course (or non-credit) in Jewelry/Metals
Instructors: Bruce Metcalf; guest instructors—Ivy Ross, Bob Ebendorf, David Keens
Accommodations: Dorms or room with local students

Oregon

Oregon School of Arts and Crafts
8245 SW Barnes Rd.
Portland, OR 97225
Telephone: (503) 297-5544
Andrea Nebel
Summer Program:
July 14–16, Colored Aluminum for the Jeweler/Metalsmith with David LaPlantz; June 16–18, Enameling Techniques on Steel with Christina Gibson Sears; July 27-30, Catches and Containers with Harold O'Connor
Accommodations: Bed and breakfast in private homes by special arrangement

Pennsylvania

Tyler School of Art
Metalsmithing Dept.
Beech and Penrose Streets
Philadelphia, PA 19126
Telephone: (215) 224-7575, ext. 261
Vicki Sedman
Summer Program: May 9–June 3, Advanced Jewelry Workshop
Instructor: Vicki Sedman
Accommodations: Housing in community

Rhode Island

The Jewelry Institute
40 Sims Ave.
Providence, RI 02909
Telephone: (401) 351-0700
Summer Residency Coordinator
Summer Program: One- or two-week Summer Residency Program beginning approx. August 1, including Jewelry Design, Marketing, Lost Wax Casting, and Diamond and Stone Setting
Instructors: Regular faculty and industry experts
Accommodations: Motels and hotels in town

Rhode Island School of Design
2 College St.
Providence, RI 02903
Telephone: (401) 331-3511, ext. 281
Marisa Parente
Summer Program:
June 27–August 6, one accredited course in jewelry and metalsmithing
Instructor: Jacqueline Ott
Accommodations: Dorms

Tennessee

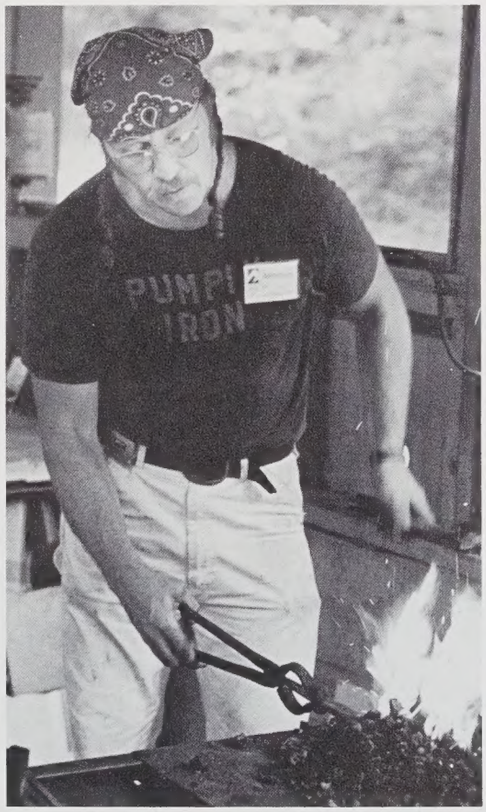
Appalachian Center for Crafts
Box 347 A-1, Route 3
Smithville, TN 37166
Telephone: (615) 597-6801
Sally Crain, Workshop Coordinator
Summer Program:
June 13–August 12. One-week sessions: June 13–17, Knifemaking with Bob Coogan; Japanese Repoussé and Chiselwork with Richard MaFong; June 20–24, Aluminum Jewelry and Chain Mail Construction with David LaPlantz; Pattern Welded Damascus Steel with Daryl Meier; June 27–July 1, Beginning Blacksmithing with Frank Turley; Metalwork for Enamelists with Pamela Hassler; July 4–8, Blacksmithing with Jim Wallace; Jewelry Construction from Tubes with Richard Mawdsley; July 18–22, Chasing and Repoussé with Richard Prillam; General Blacksmithing with Ivan Bailey; July 25–29, Titanium Coloration with Bill Seeley; Fantasy Forms in Iron with Randy McDaniel; August 1–12, Flintlock Rifle Construction with Bruce LePage
Accommodations: Dormitory-style housing

Arrowmont School of Arts and Crafts
Box 567
Gatlinburg, TN 37738
Telephone: (615) 436-5860
Sandra J. Blain, Director
Clare Verstegen, Program Coordinator
Summer Program:
June 6–August 5. One- and two-week sessions: June 6–10, Metal with Carol Kumata; June 13–24, Metal/Fiber Jewelry Techniques with Rosemary Gould; June 27–July 1, Lost Wax Casting with J. Fred Woell; Enameling with Jamie Bennett; Edge Tool Smithing with Philip Baldwin; July 4–15, Blacksmithing with Charlie Fuller; Jewelry Techniques with Chuck Evans; July 25–August 5, Metalworking—Inlay and Lamination with Hiroko and Gene Pijanowski
Accommodations: Single, double, and dormitory rooms on campus

Washington

University of Washington
103 Lewis Hall, DW 40
Seattle, WA 98915
Telephone: (206) 543-0970
John Marshall
Summer Program:
June 20–August 19, Beginning classes and Graduate Progam in jewelry and metalworking
Instructors: John Marshall, Mary Lee Hu
Accommodations: Dorms and local housing

Revere Academy of Jewelry Arts, California



Arrowmont School of Arts and Crafts, Tennessee

Arrowmont School of Arts and Crafts, Tennessee

West Virginia

Cedar Lakes Crafts Center
Ripley, WV 25271
Telephone (304) 372-6263
Tim Pyles, Director
Summer Program: July 11-29, Blacksmithing and Jewelry
Accommodations: Dorms and semiprivate rooms on campus

Wisconsin

University of Wisconsin-Madison
Art Dept.
Humanities Building
Madison, WI 53706
Telephone: (608) 262-1660
Summer Program:
June 13-August 5.
One eight-week session in beginning jewelry through holloware and pewtersmithing
Instructor: Fred Fenster
Accommodations: Dorms and private rooms

University of Wisconsin-Whitewater
Art Dept.
800 West Main St.
Whitewater, WI 53190
Telephone: (414) 472-4675
Linda Threadgill
Summer Program:
June 13-July 8, Beginning and Advanced Metalsmithing
Instructor: Linda Threadgill
Accommodations: Dorms and local rentals in town

Canada

Craft Studio Harbourfront
417 Queen's Quay West, Suite 500
Toronto, Ontario M5V 1A2
Telephone: (416) 869-8447
Jean Johnson, Coordinator, Craft Studio
Summer Program:
July 4-August 31.
Classes and workshops in metalsmithing and jewelry
Instructors: Wendy Shingler and Maureen Wilson
Accommodations: Hotels in town

George Brown College of Applied Arts and Technology
P.O. Box 1015, Station B
Toronto, Ontario M5T 2T9
Telephone: (416) 967-1212, ext. 4337
Joseph Rugole, Chairman Arts and Crafts Dept.
Summer Program: July 4-15.
Two 60-hour sessions—Introduction to Jewelry Making and Introduction to Casting Techniques
Instructors: Andrea Stulberg and Ellen Stock
Accommodations: Hotels in town

Arrowmont School of Arts and Crafts, Tennessee

The Summervail Workshop at Colorado Mountain College
by Nikki Larricq

Who has ever heard of Colorado Mountain College? It sounds like a place where my Great Aunt might have gone to teach quilting. Resting in the secluded valley of Minturn, Colorado Mountain College (CMC) offers a special summer program called Summervail Workshop which attracts artists, teachers and students from both the United States and abroad. Summervail began as a two-week experiment and has evolved into one of the West's major educational centers for art and critical studies. It offers week-long courses in painting, printmaking, photography, sculpture, woodworking, fiber, ceramics, metalsmithing, enameling, blacksmithing, hot and flat glass. In an intimate, relaxed atmosphere, the student is able to receive instruction from many noteworthy artists. Each workshop provides the student with hands-on experience in well-equipped studios and food for thought amidst the stunning mountain surroundings.

Besides the practical workshops, over the years CMC has presented numerous symposia in a variety of media which have so far been unparalleled in the West. Last summer CMC hosted its 8th Annual Rocky Mountain Metalsmithing Symposium as well as its Second Great Western Enameling Symposium. These events were held in conjunction to allow participants to attend both. Three elaborate meals a day were included in the $100 fee for each three-day symposium. College credit was available for an additional fee.

The Enameling Symposium began with an eye-opening demonstration of "Hotforming Enameled Objects," given by Bill Helwig. Helwig was available during the remainder of the symposium to answer questions and later demonstrated how to make colored enamels with oxides. Other demonstrations included "Raku and Fuming Techniques for Enamels" by Ed Deren, "Silkscreen Stencil Techniques" by Christina Gibson-Sears and "Rendering Techniques for the Enamelist" by Martha Banyas, who also showed her "Survey of Contemporary Enamel" slide presentation.

Other slide shows and discussions were presented by enamelists Jamie Bennett and June Schwarcz. The final address was given by Kenneth Bates, who shared his personal techniques and "secrets" and showed slides entitled "Fifty-five Years of Enameling." Another special feature was the presence of Dr. Harry Bober, who spoke on "The Birth of Goldsmith and Enamelwork as a Major Art Form in the Middle Ages." There were approximately 30 people at the symposium, a relatively small group, yet there was something to satisfy every possible approach to enameling.

The intimate Enamel Symposium was followed by a much larger group of metalsmiths. This year the participants included: Eleanor Moty, Bruce Clark, David Pimentel, Elliot Pujol, Carol Kumata, Bruce Metcalf, Lynda Watson-Abbott, Jim Wallace, Pat Kipper and Roger Morris, from Great Britain, who each gave slide shows and demonstrations. These embraced a variety of traditional and contemporary techniques, including: "Blacksmithing with a Coal-Heated Forge," "Steel Inlay with Nonferrous Metals," "Colored Patinas for Bronze" and "Japanese Chasing to Achieve High-Relief Form." Also demonstrated were "Glues for Cold Joining," "Delron Plastic Raising Stakes and Hammers," and "A New Technique for Coloring Jewelry and Metals with Permanent Magic Markers."

Artists working in other media were also present at CMC during the week. In the evenings slides of their work were shown, including current fiberwork, glass, illustration, and environmental pieces. Dancing, conversing and merrymaking went on into the night.

Summervail has become an annual tradition for many artists and craftsmen who come to retreat for learning, to share ideas and techniques and to enjoy the magnificent Colorado summer. For more information on the Summervail Program, write: P.O. Box 1114, Vail, CO 81658. ■

Bill Helwig and Kenneth Bates at the Great Western Enameling Symposium, Summervail Workshop, Colorado

Graduate Metal Programs in the 80s

Edited by Debra Lynn Gold

The following has been edited from a discussion entitled "Graduate Metal Programs in the 80s," held at the 1982 Society of North American Goldsmiths' meeting in Chicago. This discussion centered on the acknowledgment that metalsmithing and jewelry education has entered a new period in history. Those in higher education have already felt many changes, some not very positive. Each individually is finding ways of coping with and responding to current trends within learning institutions. This discussion was aimed at identifying and examining those issues concerning the education of metalsmiths in order to better assess the role of both educator and student.

Some unanimous sentiments surfaced during the discussion, particularly the fact that the sole purpose of graduate programs is no longer to breed the next generation of educators. However, now in the face of less than favorable conditions, the task of both educator and student remains the nurturing of quality within the profession.

The panel, moderated by Stanley Lechtzin (Tyler School of Art), included educators Brent Kington (Southern Illinois University), John Marshall (University of Washington), Eleanor Moty (University of Wisconsin-Madison) and Richard Thomas (Cranbrook Academy of Art), and students Paula Garrett and Stephen Walker (Southern Illinois University) and Janice Kluge and Sarah Nelson (University of Wisconsin-Madison).

Stanley Lechtzin *All of us have been involved in graduate education of metalsmiths, jewelers, goldsmiths, silversmiths, blacksmiths, for at least 10 years. We have seen many changes in that last decade. We've experienced great expansion, or, at the very least, seen an era of expansion come to a close. I don't know that there are many new metalsmithing programs entering the field at the moment. It is far from the situation that we experienced in the mid to late '60s when many of us started teaching. The organization that we are all members of derived its membership and support by-and-large from people who have gone through college and art school programs. It seems to me that it is time to take a look at what has happened and where we are and where we might all want to be 10 years from now. I don't know that we're going to come to any conclusions or be able to make any recommendations, but I would like to think that today we will start and I would hope at subsequent meetings we will continue these discussions.*

The first question I have for the panel is a characterization and an evaluation of what they have found occurring in the graduate education of metalsmiths over the past 10 years and where they feel we are at the moment. Essentially what I'd like to see addressed is the changes from 1970 through 1982.

Eleanor Moty It seems that in the early '70s the Vietnam war had a major impact on all of us. People were obviously trying to stay out of the army. Competition was very high. Jobs were still available then and there were really strong ties among art departments all across the country. People were very much directed. In the later '70s that wasn't the case. They weren't necessarily wanting to go into teaching although there were still teaching jobs. Things were also changing budgetarily. For instance, at the University of Wisconsin the legislators were slapping our wrists because of the riots taking place on campus in the early '70s during the Vietnam War. The legislators felt that the rabble-rousers were the out-of-state people, so the out-of-state tuition was raised. We were finding that we had more and more of our own students as grads. Budgetary problems continued later in the '70s in that all sorts of financial aids were cut back. Jobs, too, were being almost eliminated. If there were jobs, we saw more of a musical chairs type situation, with people who were already situated moving up into more plum positions. Jobs which might have been two-person positions closed down that second position.

Brent Kington I want to agree with Eleanor that we had a lot of people avoiding the war in the late '60s and early '70s. A false euphoria was experienced by the administrators of universities based on those (rising) enrollments. They have come to realize that it was false (now that) we are experiencing a drop off in enrollments in many areas. In the late '60s I suppose most of us could guarantee any of our students who wanted to teach a job. Everything was busting out and expanding. Now we're going through a great concentration period of pulling back. I suppose at the time that was happening I became worried that we were overexpanding. How many people in our society and culture should be in this field? How many really qualified to be trained to go out there, and was our society ready for it? Did they really want the product that these people were going to make? And why all of this expansion when a lot of universities weren't prepared to pay the bill? Expansion occurred when basically the same space limitation and equipment limitation existed. Institutions opened masters programs (that) were just simply built on top of undergraduate programming because the student demand was there. The faculty did not receive more equipment, more tooling, more space, and particularly the specialized space for graduate programming. I don't know that it's an unhealthy syndrome today to see some of those programs collapse. The thing that impressed me 10 years ago was the well qualified, bright, energy-charged person that was going out. Within a couple years I saw the quality or nature of the student change. On the undergraduate level the student wanted to know enough to get out and sell street jewelry. If that was how to bend up a spoon ring, that was enough. If that was how to solder and stamp designs, that was enough for some people. That characterized a group of students that, I think, not only lived within our field, but in ceramics, fibers and so forth.

Debra Lynn Gold has been an educator for eight years and a graduate student for three years before that. She currently teaches at Illinois State University.

They weren't necessarily interested in the esthetics, they weren't interested in a deep foundation they could draw from as far as personal growth. They were interested in survival. The craft fair expanded at about the same rate that those people were coming out of school. American Craft Enterprises, sponsored by the ACC is simply a response to a particular kind of people.

At this time I think we're going through a totally different cycle. I personally, experience a group of people in the graduate level who are extremely interested in their personal esthetic growth as artists, and I'm pleased to see that.

John Marshall I prefer to look at change as being very , very positive and I think it's a good way for young people to approach the problems that are facing them right now . . . the idea of being very flexible. We've got to start telling people that basically what we're teaching (them) is to open their eyes, see something and make a decision. I get a little disturbed with people that finish school and lock themselves into a position right away. My advice to young people when they are coming out (of school) is to move, travel, open their eyes, look at other possibilities and job situations. Get yourself into something else if the metal field is a little bit heavy. I'm very sorry that I came out of school and became a teacher. I was going to work for General Motors and be a modeling designer. It was a great chance for me to work in another field and start to get enough money together to build my own studio. But then the Dean from Syracuse asked me to teach, and that's how it started. Those jobs are not falling in your laps these days. I took that job with a B.F.A. That just won't happen today.

Eleanor Moty We have 133 grads in our art department and 36% of those graduate students are over 30 years old. That's something you did not see 10 years ago. Students are coming back to graduate school after having been out of school for a number of years. They really are motivated.

Richard Thomas I would confirm that. I think that the significant change of the '70s really has to do with the attitude of the student in relation to his professional education. The student has become much more concerned about the nature and the quality of his professional education. I'm amazed at the sacrifices the students will make in order to spend two or three years pursuing an advanced degree. And, strangely, the degree itself as an end product is not nearly as important as the educational process that brings it about.

Stanley Lechtzin *Are as many undergraduates electing to go on to graduate school? Do you feel that those who are are being properly advised as to the values of graduate education, the appropriate programs for them to examine with an eye to their own graduate education, and, perhaps, the alternatives to graduate school?*

Richard Thomas I have advised undergraduates applying directly from other undergraduate schools to our program to take a year, a couple years, off and gain some "life worthiness" before becoming an artist. Life worthiness is difficult to acquire if one is in an educational institution all one's life.

John Marshall One of the major roles of someone in a teaching situation is advising. In most cases, I try to have my undergraduates go elsewhere. I think it is a good experience to go someplace where they are going to be teaching a different attitude. This advice is very important, but the problem is the expense of it. So, again, the responsibility falls on us as educators to keep a certain amount of real change and growth so that if you have to keep a student as an undergraduate and a graduate you make it well worthwhile.

Stanley Lechtzin *What do graduate students today expect of a graduate education? Can a response to that (question) be generalized or does each student choose graduate education or a graduate program for very personal reasons?*

Janice Kluge Every graduate student goes into a graduate school with different expectations and different needs. They're going to make jewelry or they're going to go out into the marketplace. What happens is a lot of them become involved with metalwork as a sculptural art form. You're getting an eclectic grouping of people and artists that all have different types of needs and the programs are going to have to allow for this pluralism. The instuctor has to allow freedom. Training should be available for the person who wants to go into production or the market. If the student wants to be trained as an artist or sculptor they should be allowed to go into other areas in the art department to pursue that type of artistic growth.

Sarah Nelson I came to graduate school to have a forum to discuss growth. I was isolated as an undergraduate. I felt that I needed graduate school because I needed that group of people working together in a tight bond. It makes us bounce off each other and grow in a way that I could never have grown working in isolation. I feel that it also gave me a sense of professionalism that I could never have achieved on my own.

Paula Garrett I agree totally with what she said about a need for a peer group, a response. I did come to graduate school for personal growth. The peer group feedback is very important. You learn skills from them. You get ideas from them. It's been very good. I came from a situation where I didn't really have that.

Brent Kington Two decades (ago) I thought of myself as a commercial designer, an industrial designer. I wanted to be a prototype maker Most of us at that time had no real thoughts of education. I was told that if I wanted to survive I would survive. That was just about all the help I was given other than, "Try education for one year. You'll like it. You'll persist some way." You're going to make concessions as far as your lifestyle is concerned. One remark to students who want to go into education is that they're selling their time one way or the other. There are so many hours a week that they're going to be able to put in on their work. They're going to be trading their time some way, whether it's on a production item three days a week, pumping gas three or four days, or teaching.

Stanley Lechtzin *My experience in looking at graduate applicant portfolios is that more and more applicants are coming from small undergraduate art departments that don't have graduate programs. Do the other panel members agree? Another point is the request of our students that our programs be multi-faceted, that we allow for diversity. Are we doing that? If not, how can we?*

Eleanor Moty Yes, people are coming from very small programs. They are also coming to visit the programs before they apply. They have an idea of what they want. Quite often, graduate school is that opportunity to get more than they had in their limited situation prior to the graduate program.

Stanley Lechtzin *What does this mean for the larger programs? Are the undergraduates from larger programs interested in graduate school? If so, what do they want in a graduate program? They've had the exposure to a lot of people, to a lot of ideas, to a good deal of exchange.*

John Marshall The majority of my undergraduates have been going to other programs. We look at the faculty. The school can have a tremendous facility, they can have everything that walks and talks, but you might as well not go if they don't have the right faculty. Some of my people are going to the larger schools and some to the smaller ones. I advise my people to go see the school. I tell them to sit down with the students, to talk with them about the faculty. Are they getting some input, or do the faculty come in, touch base and go out to do their own work? I also tell them that if it's not working out after six months they should go someplace else. It's such a precious two or three years and it shouldn't be wasted. I get very worried about (a student's) identity. I've seen my students go someplace else and pick up somebody

else's thing. Their forms will change, their ideas will change. Our role as graduate faculty is to help them build their own identity. When you sit down with a graduate student you're trying to put your head into theirs, trying to support their direction, not make them another "little Marshall."

Brent Kington We are in the business of advising those students who should go on to graduate programs to study with particular people for particular reasons. Perhaps this program because of that personality could do more for you than this program with that particular personality. We've also got to advise people who really shouldn't go on not to go on. That's hard on the faculty member and it's tough on the student.

Eleanor Moty One new phenomenon is that both undergraduate and graduate students are taking on jobs more than ever. We have very little in terms of financial aid. I think that's one of the factors that's causing the drop-off in enrollment.

Brent Kington I had the privilege of one of the best learning environments as a graduate student. I had to be at my desk at 9:00 in the morning. I knew I couldn't leave until 5:00. I knew I couldn't have an outside job. I had put a note on the desk if I went to the library to account for my time. Most of the kids today in the graduate program do have to do some sort of work and it's debilitating. Those jobs are very demanding. They eat up peak time out of their lives and (drain) their creative energy. Maybe we should be looking at a longer education. Our sculpture department moved to a three-year program for those students who have any sort of outside work to allow for the necessary maturation. The danger of this is the tendency to hold on to students longer because there are less students. I'm opposed to that morally. I know some institutions are talking about five-year undergraduate programs, others are talking about three-year programming on the graduate level, in order to hold those people they've got.

Sarah Nelson I think it's important to take a job that is either good on your resume or doesn't zap your energy and keep you from centering on what you're there for. To get the most out of your graduate experience you really have to think about the job you're going to take. Either find something that isn't in your field or one that will boost your experience as an artist.

Stanley Lechtzin *Are undergraduates staying on to continue their graduate education in the same place because they can't afford to move? Are faculty advising them to stay because they need one or two graduate students to keep the program alive?*

Dieter Mueller-Stach (from the audience) One reason the majors stay on is because they realize that teaching may not be a future (for them). Students take more classes to be studio artists, to use the facilities to generate a better portfilio, so they can look for graduate studies at a later time when they can more easily afford it.

Stanley Lechtzin *When we talk about opportunities in the field for graduate students, are we still talking about teaching? Is (the desire to teach) the only reason to go on to graduate school? Is the M.F.A. strictly a teaching certificate?*

Brent Kington My experience is that people want a personal development. They're not looking at a job. Increasingly, I have people who have been informed in their undergraduate programs that there's not a good market, yet they've already made up their minds to go into the field.

Richard Thomas Our faculty has been actively discussing the elimination of the M.F.A. degree as a goal. Of course, there's some opposition to this by reason of conforming to academic protocol. It seems we might have to revert to a dual program in which the M.F.A. degree could be offered as a contiguous event. A two-year exposure with greater freedom because the goal is not defined does have its advantages. Another purpose is to divert people from teaching to professional training in the arts.

Stephen Walker I think the reason a lot of students think about teaching is that all our role models are teachers. I've been fortunate because I've wanted to learn how to earn a living in the field and all my teachers have been very good at teaching me how to do this. But it has been something I've gone after. Most people end up selling themselves, either to a corporation or to an institution, but we are in a position to create our own jobs.

Paula Garrett I went into jewelry because I thought I could make a living. I did a year of graduate work at the same institution where I got my B.F.A. because I felt I needed to catch up on technique. You have to consider whether you'll be able to make a living while you're an undergraduate. It should be a concern of advisement at that level. It's important in the graduate program to know you have options other than teaching.

John Marshall Many times we're so concerned with our own little house that we don't see the whole scope of things. I feel it is very important that an undergraduate student go elsewhere for their graduate work. But the problem is the financial burden that's placed on the student by moving to another state. It's the graduate students coming in (from out-of-state) that are pumping in new ideas, new attitudes. I look forward to having graduate students come from other places because *I* learn (from them).

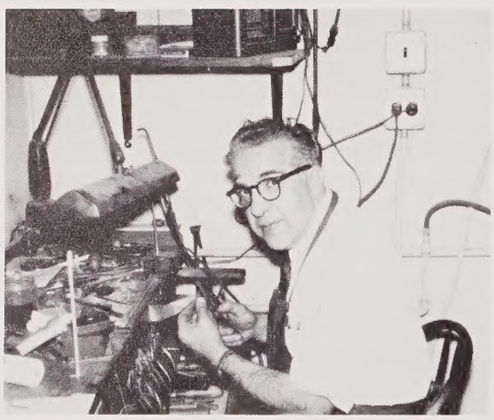
Another thing (we've discussed) is the graduate student falling into the production line. The students who have an understanding of design, who are able to see things, are the ones that are working out. It's nothing to teach someone how to rubber mold something. People feel they've got to learn all these production line things to go out there. You don't. Just acquire the ability to see something, acquire an esthetic.

Stanley Lechtzin *I think we touched on a number of very important issues today. We have a better picture among ourselves of what is currently occurring across the country, what we, as individuals, perceive as problem areas and possible concerns for the future. One thing that hasn't been looked at too carefully that is, perhaps, economic in nature, but has much more serious implications, is the static nature of faculty. We've talked about pumping a new vitality into programs by bringing in graduate students from other programs. At best, that is a very haphazard procedure. The limitation on (faculty) movement imposed by the economics is something to look at.*

I would like to conclude with the suggestion that as our meetings continue through the years, we set aside time for workshops on education in which the entire membership of the Society of North American Goldsmiths can participate. I don't think we can do too much as an organization about the finances that we each have to cope with in our institutions, but through cooperation and concerted effort we can continue to provide a high level of education for the students in the years to come.■

Nathan B. Winkler
Bridge between Industry and Art

by Anne Krohn Graham



Above Nathan Winkler at the bench, 1960. **Opposite page** Winkler with a group of his George Westinghouse High School students, 1949

Anne Krohn Graham is an Associate Professor of Art at the University of Delaware Newark, Delaware, where she heads the jewelry area of the Department of Art.

The day I had the opportunity to spend with Nathan Winkler, gathering information for his profile, was unforgettable, stimulating, enriching and fun.

On pondering the many impressions I had of Winkler, I realized that he actually assumes four distinct roles in the jewelry profession at one time. First, he alternates between studio metalsmith—designing and fabricating his own work—and benchworker in the trade—model making and design consulting to the industry. On the day of my visit, we spent five hours touring the Court of King Arthur in New York City—a large jewelry casting house. Next I saw Nathan Winkler, the educator. Throughout the day he was able to share information equally with Arthur Altman, president of the casting house, and with me, a teacher of jewelrymaking in a university art department. Third, I saw Winkler in the role of technical editor to a jewelry trade magazine. That day he was gathering the ingredients for an upcoming article in *Jewelers' Circular-Keystone*. Finally, I saw him as an eternal student, traveler and storyteller—a delightful man—and one who has developed many personal friendships among jewelers from all walks of life around the world.

Born in England in 1905, Nathan Winkler lived an unconventional childhood. Self-reliant and resourceful, he spent his early years finding his way into the New York City jewelry industry and later into teaching jewelry. Both of these have provided him with a rich background. To complete the circle, in the fall of 1982, Winkler was honored with an associate membership to Britain's Worshipful Company of Goldsmiths for his outstanding contributions to jewelry education and the jewelry trade. Only about 50 memberships outside of England have ever been awarded.

The roots of Nathan Winkler's training as a jeweler come from his father who was a watchmaker. His father had lost his leg in a London air raid and had worked at home. When at the age of 13 Nathan dropped out of school, his father enrolled him in the International Correspondence School for four to six months in the field of drafting. That same year his family moved to Canada, where on the strength of the brief drafting course he took a job, saying he had had two years of training.

For a time he worked in the watch repair department at Henry Birks—Montreal's leading jewelry store. He eventually was fired from the firm because he handled a watch like a piece of iron. He remembers, "I was leaving fingerprints on it when I should have been using tissue paper. I'd be damned if I could use tissue paper on a watch movement."

He worked at watches for a while and also in a ladies' garment factory and as a sign painter. When he was only 14 he left home and headed south for New York City. Coming to the United States meant a great deal to him; he even remembers the exact date: Friday, August 29, 1919. Because he didn't have legal documentation to emigrate, for a while he was haunted by immigration officials trying to get him back to Canada.

Fortunately, he had relatives in New York City with whom he could stay. Shortly after he arrived he was invited to his cousin's engagement party. There he was offered a job in jewelrymaking. He thought he would take the job and then see what happened in his other fields of interest. But his prospective employer advised him to make up his mind first; it would cost money to train him, so if he took the job he must stay with it.

For a few years Winkler was employed full-time in the jewelry shop, but he was always looking for ways to increase his earnings by answering industry ads and working after hours. At age 16 he was still doing routine work, making machine-prepared platinum bracelets. He had to drill holes in them, solder wires, connect and finish them. For 44 hours of work, he was making $10 per week. Realizing that engineers could get $35 to $40 per week,

he thought of going back to drafting, but decided to stay with jewelry when he found that people doing specialized work, like making clasps, were making $100 per week.

Winkler set up a bench at home and worked for other manufacturers on the side. He learned properly how to make jewelry such as fancy bracelets, pendants, pins and rings only after he became a shop foreman at age 18. Then he could ask the other jewelers questions. Before this, his coworkers would not share trade secrets with him.

It was Izzy Shor who got Winkler thinking about teaching. I. Shor, the jewelry tool distributor, had an account with the School of Industrial Arts in New York City and knew they were looking for another jewelry teacher. The teaching career sounded interesting to Winkler. At first the vacations appealed to him, vacations he had never had. So he started working for the School of Industrial Arts (later called the High School for Art and Design). But it took 10 years for him to get the vacation, because he spent all his free time back at school taking courses.

Somewhere along the line he obtained a high school diploma so he could attend the University of the State of New York for teachers' training courses, then New York University, where he received a B.S. in Vocational Education, and, finally, a Masters degree in counseling and guidance. Meanwhile, he took another teaching position at the Brooklyn High School for Speciality Trades, presently called George Westinghouse Vocational and Technical High School.

Practically all of the time he was teaching he worked in industry on the side. At one time, to further his business, he ran a newspaper ad, not just a classified ad, but a display ad, in *The New York Times*. It read: "Can you afford my services? I have considerable background in jewelry making. I can take your line that you have produced until now and make recommendations for changing your style entirely, using the dies that you have now."

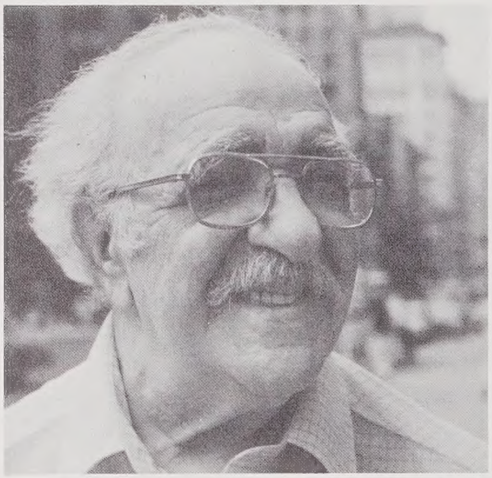
He got three answers. The first was from the National Silver Company. When they asked Winkler how he would start, he said he would ask their toolmen to make a stamping of every die they had. Then he would play around with the dies, using part of one and part of another and perhaps making here or there an experimental master die. The company wanted Winkler to start immediately, but when he mentioned that he wanted to work only part-time in order to continue teaching, they rescinded the offer. Arde Bulova also responded enthusiastically to Winkler's ad, but the problem was the same: he did not want employees with another job of any kind. Finally, the third answer to the ad worked out. It was from a local jewelry manufacturer who didn't mind part-time work. So Winkler took on an engagement ring line, making changes and new introductions in what they had.

Even while he was busy with his recently found employment, Winkler was still carrying a full teaching load at George Westinghouse High School. Because he entered his teaching career with such diversely practical trade experience, he was in a unique position as a teacher. As he puts it himself, "I don't know what would have happened to the jewelry industry if it hadn't been for our school. We kept feeding them. We had a waiting list not of students who wanted to get into the school but of employers who wanted our students. Our kids went to work in their junior year, sometimes in their sophomore year (high school). By the time they were seniors they had jobs—they were out on work-study programs. We taught them a broad base so they could theoretically fit into any area of a commercial shop. For example, we had one manufacturer who called and requested a boy for setting stones in men's rings. I knew we were dependent on the needs of manufactuerers. We were giving the kids jobs. I suggested that he send me a couple of dozen of the castings in silver and some stones—chipped—it didn't matter, and in two weeks I could give him students who could set stones. My students thought it was an excellent job opportunity because the industry was always looking for stone setters. In addition, once in the shop, the students looked around for any opportunities available. These kids knew that the only way you learn this trade completely is to get a number of jobs, because most employers try to keep you with one particular operation. I taught the students that they have to change jobs periodically to fully learn this industry. I told them, if you are not sure of yourself, stay there, but if you feel you can make it, get out and diversify.

The proof that Winkler's teaching methods were successful and had lasting impact on the trade is exemplified in one of his anecdotes: "One of my earlier students established himself as a diamond setter. Now this was a kid I had occasional problems with when he was a student. But now he said he was doing quite well in his own business—had a partner—and wanted me to send him a kid so that he could teach the boy diamond setting. I sent him one (this was a class of reluctant students—all of whom had spent some time in jail). Six months later he called for another. You know that over the next four years he took nine of my problem kids and eight of them stayed in the industry; seven of the eight are in business for themselves and I still hear from some of them.."

Instances like this kept Winkler in the teaching profession for over 30 years. He was always torn between the love of his craft and the love of teaching it. When he tried either career without the other, he did not feel fulfilled; he needed one to reenergize the other. He retired from George Westinghouse in 1973, after being assistant principal for 19 years.

Teaching also provided Winkler with diverse travel opportunities, which he used as a further source of self-education. He believed the only way to see a country was to take a course there and see it in depth. One of his fondest memories of



Winkler in Manhattan on assignment for *Jeweler's Circular-Keystone*, 1982. Photo: Anne Krohn Graham

travel and sharing experiences took place in Norway at the University of Oslo. There he first met Bob Ebendorf; they were both studying the Arts and Crafts of Norway. Ebendorf had just finished his masters thesis and was on a Fulbright. The way Ebendorf approached a recent piece, a silver ladle, fascinated Winkler: "Ebendorf showed me the piece and how he designed it; it was inspired—a real eye-opener. He had taken an onion and let it rot. Every day he made a sketch. He used the limp form as a basis for this piece. It was magnificent." At the same time Ebendorf marveled at Winkler's knowledge of commercial jewelry and modern casting methods. It was truly a learning experience for each.

In the 1960s, when Winkler began to write for *Jewelers' Circular-Keystone* magazine, travel became even more rewarding. His *JC-K* card gave him entree to virtually anywhere in the world. This permitted him to document traditional methods as well as new adaptations, thereby gleaning valuable information on jewelry technology. Winkler sees travel as a fulfilling experience where he can enhance his knowledge of jewelry techniques, carried out in different places by different people, with their own unique methods.

Oporto, Portugal, known for its filigree, was of special interest to Winkler. Here, as on so many of his trips, he found himself exchanging information from his area of expertise in order to learn of an indigenous technique. This time he had come to see how filigree jewelry was made. Upon arriving at a factory where enormous enlargements of filigree photographs adorned the walls, he was told that they did not make filigree there. The manager of the factory, however, wanted to know if Winkler knew something about centrifugal casting. Winkler said, "Yes. Why?" The man then said he had some questions to ask. Winkler couldn't believe the audacity of this man to ask for information and yet not be willing to give any.

As it turned out, the filigree was not made there but rather at the workmen's homes nearby, because it was cheaper that way. The manager arranged to have a benchman come and give a demonstration of how it was done. They demonstrated how filigree wires were made and also how the wires were soldered. Filigree work is largely built with ribbed wires for the sake of appearance. When a perfectly flat wire is used, it is made to contrast with the ribbed wire. Filigree work deals with ornamental wire in effect. The wire is part of the design. And how did they make this ornamental wire? Originally they did it by threading a piece of round wire, as though they were making an ear wire. They would thread the whole length of the wire and then roll it through a flat roller. As a result the edges looked as though they had been milgrained. To save considerable time threading the wire, the worker drew the wire down square, twisted it then rolled it to get a similar effect. (When Winkler returned to his studio, he drew wire in triangular form, twisted it and rolled it. He was able to get an even, more pronounced bead using the twisted triangular wire.) To complete the filigree demonstration they showed Winkler how they joined the wires with a solder paste. After the demonstration, Winkler exchanged information with the factory owner about casting.

When you store up a lifetime of experiences it's very rewarding to share it with others. Winkler's philosophy of professionalism for the production jeweler as well as for the jewelry teacher derives from these experiences. In the case of the production jeweler, he believes there should be a background of ethics directed towards the jeweler's specialty, which involves maintaining quality standards in both metals and workmanship. He maintains there should be no sloppy short cuts that will save the manufacturer money but potentially cause problems for the wearer of the jewelry. In teaching jewelry, Winkler advises: know the level of your classes, whether they are interested amateurs, teachers or serious vocational students. Professionalism in vocational education involves training students to the job demands and specifications of the industry.

As an editor for *JC-K,* Nathan Winkler continues to educate several different audiences: the professional, the student and the general public. He hopes the right person will read what he writes, even though the magazine is slanted toward the retail jeweler. He writes more for the manufacturing jeweler, but he does as much as he can for both areas. In a conscientious effort to reach his readers, he answers every letter written to him in the "Workshop Questions and Answers" column.

Winkler encourages diverse parts of the jewelry field—the artist/craftsman and the commercial jeweler—to discover what they can learn from each other. He would like to erase the imaginary line that has been drawn between the two groups. Currently, each looks down on the other. For example, the man in industry needs to know that fine art can command profit. The artist/craftsman needs industry in order not to produce a "one-at-a-time" pace, allowing him more time to create.

Nathan Winkler would like to be the bridge that joins and enriches both areas. He knows the commercial world of jewelry, what it is and what it is looking for. At the same time he appreciates artists who are doing one-of-a-kind pieces and their need to connect sometimes with the jewelry industry. His philosophy on exchange is best expressed in his own words: "My outlook has changed since I have gone through the teaching business. The most difficult thing for me to forget was the trade secret aspect of the work, and I think I've lost that completely. I don't mind sharing trade information with anyone who can use it." ■

Update II **Mokume-Gane** Introduction

by Hiroko and Gene Pijanowski

The following technical article consists of a collection of papers by Steven D. Kretchmer *M.F.A. candidate, 1982,* Mark Morgan *B.F.A. 1981* and Ruth Taubman *B.F.A. 1981* of the School of Art of The University of Michigan under the guidance of Professors Hiroko Sato Pijanowski and Gene Pijanowski. This research was supported by a Rackham Research Grant awarded to Professor Hiroko Sato Pijanowski in 1979 and completed in 1981.

Information concerning the traditional Japanese mokume-gane technique was introduced, in the form of a technical paper, at the Society of North American Goldsmiths' conference held at the University of Washington in Seattle in the spring of 1977.[1] There was, and still is, a great deal of interest and enthusiasm for this unique technique. The simplicity of the process of forming the billet—numerous layers of compatible nonferrous metals and alloys adhering without solder, layers that will not come apart while stretching and forming—is appealing, as is the process of diffusion—the primitive fascination with fire, the beauty of the pattern suggesting wood grain inherent to the laminate and the limitless size of the patterned sheet.

Perhaps a minimum of 250 people actually practice the process, most having learned from workshops, and probably a few thousand know of it from published articles.[2] A few universities, particularly Southern Illinois University at Carbondale and The University of Michigan, have continued research to simplify the process, a view shared by Japanese mokume-paper craftsman Norio Tamagawa.[3] A few innovations have been made, primarily in pattern development, utilizing blacksmithing methods and adopting industrial processes. We feel that the basic study and practice of the traditional methods of mokume-gane have been understood and much has been achieved.

It has been more than 300 years since mokume-gane began to be practiced. The Japanese practitioners used metals of pure gold and silver, copper, shakudo, shibuichi, shiro-shibuichi, kuro-shibuichi and kuromi-do diffused with charcoal and coal. A *kozuka*[4] made by Shoami Dembei, the originator of the technique in the 1600s, utilized pure gold and silver, copper and shakudo. One of the current masters, Mr. Masatashi Yagihara (1902-) practices the technique with silver, shibuichi, kuro-shibuichi, shiro-shibuichi, shakudo and copper using a gas furnace. Mr. Gyokumei Shindo (1892-1981), Mr. Nobuo Tamagawa (1941-) and other craftsmen practice with copper, shakudo and/or kuromi-do and silver. The traditional coloration or patination is produced by the use of a commercially available Japanese compound called rokusho, combined with cupric sulfate in a boiling or steaming solution of water.[5]

Above Bronze and copper mokume-gane samples by Mark Morgan. Top to bottom: color by rokusho on 10%, 15% bronze and copper; green color treated with ammonia on 7%, 11% bronze and copper; color by rokusho on 7%, 11% bronze and copper. Each sample approximately 4 x ⅜". **Right** Gyokumei Shindo with his mokume-gane vessels. We are deeply sorrowed that this fine mokume-gane practitioner has recently passed away. He shared his home, workshop and attitudes toward work with us

Industrial heat-treatment facilities to fuse and diffuse hot metals and alloys include double-chambered oxygen-free kilns, stainless steel foil envelopes, T.I.G. welding,[6] pressure plates of stainless steel and hot rolling in a vacuum. Kilns, forges and/or torches with the basic theme of producing an oxide-free environment or "heat" with electricity, gas, propane, coal, coke and/or charcoal are some of the options available, all dependent upon accessibility. One can ask: What of the future? Lasers? Rubbing two pieces of metal together, friction? Pressure only? Powdered metals? Electroforming? Dipping? Hot spraying? All of the above should be possible to create a "stack," "sandwich" or laminate that is malleable, ductile, with good elongation characteristics.

What else can be added to established traditions of mokume-gane—other materials, coloring formulas and/or patterns? The intention of the following papers is to explore a few possibilities, to adapt "knowns" to mokume-gane with the minimal facilities of a university metals studio.

Mark Morgan was interested in bronze as an alternative material to be used in the mokume-gane process. He went back to ancient bronze which contained no zinc for his investigations into making his own alloy. He also wished to explore alternatives to the reddish brown, grays and blacks in patination with rokusho. With bronze he has learned to achieve greens and blues, some iridescent, or to retain the natural color of the material.

Steven Kretchmer believed colored golds of the same karat would open new vistas for use in precious jewelry. His concern was wearability, since most metals and alloys used in mokume-gane were chemically patinaed and could wear or rub off. The problem of hallmarking a mixed-metals piece was also a concern.

Ruth Taubman was interested in industrial equipment to produce mechanical patterns. Her other interest was the production of a pattern with minimal wastage, utilizing basic forging techniques. ■

Above Steven Kretchmer, *Ring,* 18k golds; yellow, green, red, palladium white, nickel white; ruby, 5.5mm h. x 22mm outer diameter. **Below right** Hiroko and Gene Pijanowski, *Earrings and Brooch,* 10% bronze, kuromi-do, 3¼ x ¾"

Notes

1. Pijanowskis, "Lamination of Non-Ferrous Metals by Diffusion; Adaptations of the Traditional Japanese Technique of Mokume-Gane." *Goldsmiths Journal,* August 1977, pp.20a–20h
2. Pijanowskis, "Update: Mokume-Gane (Wood Grain Metal)," *Goldsmiths Journal,* February 1979, pp.16–20.
Members of the Graduate Program, Southern Illinois University/Carbondale; compiled and edited by W. Ard, "Return to the Forge (Extended Research into Mokume-Gane and Granulation)," *Goldsmiths Journal,* August 1979, pp.A–G, reprinted in *Metalsmith Papers of the Society of north American Goldsmiths,* 1981.
Ard, W., "Studio Mokume," *Metalsmith,* Winter 1981, pp.46–51.
Pijanowskis, "Mokume-Gane," *Goldschmiede-Zeitung—European Jeweler, Uhrmacher-Zeitschrift,* 7–81, 1981, pp.7/50–7/53
3. Pijanowskis, "Mokume-Gane (A tribute to Three Japanese Craftsmen and Their Metalwork)" *Craft Horizons,* February 1978, pp.32–35
4. "The small knife carried in a pocket in the scabbard . . . " G. Stone, *A Glossary of the Construction, Decoration and Use of Arms and Armor,* Jack Brussel, New York, 1961
5. *Ibid.,* Pijanowskis
6. Hiroko attended a T.I.G. welding workshop organized by Professor Marcia Lewis at Long Beach City College in 1980, where she created fake mokume-gane by T.I.G. welding. Gold and copper wires were melted into fine silver sheet; they mixed like watercolors on paper. The metals used created new alloys of six or seven colors resulting in fascinating effects

Update II
Bronze Mokume-Gane

by Mark Morgan

This paper concerns the use of various bronze alloys, consisting of copper and tin, used in the traditional mokume-gane process. My object in this research was to find a bronze that could be diffused traditionally, thus making it possible to achieve a gold color without using gold and also to widen color possibility in general. Traditional bronze (copper, tin) has many patinas. To use bronze in mokume-gane means that the wide patina color range of these alloys can now be applied to patterned metal.

Most commercial bronzes tested proved unsatisfactory. A few commercial alloys would diffuse into a mass fairly well, but when worked to develop patterns, the billets had problems. The commercial alloy which I found to work the best in diffusion was a phosphor bronze. This is basically a copper-tin alloy with phosphor added. The problem with the alloy I used was that the phosphor content was too high, thus making the metal unsuitable for mokume-gane. My research into commercial bronze was not thorough or complete. I wanted to produce my own alloys so as to get specific qualities both in workability and coloration. After some research and experimentation, I found a suitable alloy which could be diffused and was workable hot or cold.

The alloy I worked with was a basic copper-tin mixture with very small portions of phosphor added. Too much phosphor will make the metal unworkable when hot and very difficult to work cold. The commercial phosphor bronze, with 0.5% phosphor or above, is used for bearings and machine parts because of its corrosion and wear resistance.

After making phosphor-bronze alloys, my experimentations proved that this alloy is fairly workable hot or cold when the tin content remains under 10%. Above this, the metal rapidly becomes less and less workable. At around 20% tin content, the metal will shatter when worked cold. I discovered that it is very important to make the alloy properly.

Alloy Making. All the alloys I made were produced in small amounts (100-400 grams) in small clay or graphite crucibles. The heat source was either an oxygen-acetylene or natural gas-oxygen torch. I also melted larger quantities in a blacksmith's forge in graphite crucibles with equally good results. The metal is alloyed by first melting the copper and then adding the tin, which is either wrapped in copper foil or is molten when poured. I slightly overheated the copper just before adding the tin to aid fusion.

The alloy must be kept as oxygen-free as possible while it is molten. Oxygen in the metal will make the alloy porous and weaken it for forging and manipulation. This is why small quantities of phosphor are added to the bronze. Phosphor serves to deoxidize the metal, driving off gasses and making the alloy much more suitable for working. All that is needed is a touch of phosphor to deoxidize the metal; later the phosphor is driven off, leaving just a trace. However, if you add more phosphor than is necessary for deoxidation, it will remain in the alloy and affect it. I added approximately .005% phosphor to the alloys I made.

Phosphor in copper-tin bronze serves three main purposes. First, as mentioned, it deoxidizes the metal, rendering it more workable. Second, it makes the alloy more corrosion resistant, and, third, it keeps the tin in the alloy from being given off as oxides when the metal is heated or melted. A few other methods to deoxidize and keep the bronze clean are: keep the molten metal under a layer of charcoal in a graphite crucible when melting, or stir the molten alloy with a green branch from a tree just before pouring, a practice followed by ancient bronze workers.

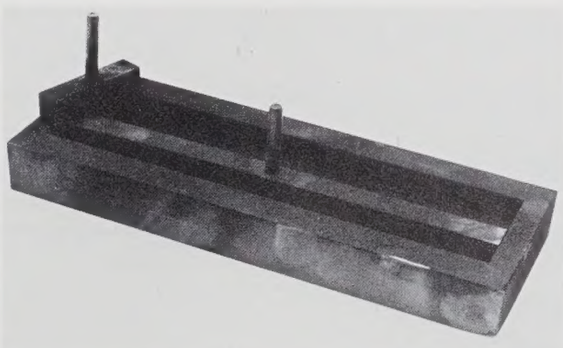
After the metal is fused well, it should be poured into ingot molds and remelted at least three times. This is necessary to make the fusion more complete. I used both a Japanese open-face and a closed ingot mold with equally good results. It is important to pour the metal smoothly and as fast as possible without creating too much turbulence. The ingot mold should be warm and dressed with carbon.

Alloys I worked with ranged from 1% to 25% tin. The color of this range progresses from copper color (1%), to orange-gold (5%), to gold-yellow (10%), to light yellow (15%), to white (20%). I diffused and manipulated this range with good results.

Cold working can easily be done with alloys from 1% to 15% tin, although manipulation of the metal is less difficult when working hot. Above 15% tin content hot working becomes necessary. To avoid having to use industrial equipment for hot rolling, I purchased a 120mm hand rolling mill which I use for hot rolling only. This worked well for me, and the machine, if used carefully, will hold up well.

Laminating. In laminating, careful consideration must be paid to the melting points of the alloys to be used. These must be fairly close to insure good diffusion. If one alloy has a much lower melting point than the other metals combined in a billet, it must be placed between all other layers. For instance, a billet containing layers of copper, 5% tin bronze and 15% tin bronze should be stacked with the 15% tin bronze between all other layers, as the melting point of copper tin bronze lowers with the addition of tin. (See Table I for melting points of bronze alloys.) The layers of bronze and/or other metals, such as copper, silver, and so on are cleaned as usual, stacked and bound with steel places and bolts.[1]

I used a blacksmith's forge and coal as my heat source. Industrial coke will work just as well. As usual with the diffusion process, the metal must be heated evenly and withdrawn from the fire when it "sweats." The length of time it will take to



Above Bronze mokume-gane by Mark Morgan, 40 layers consisting of 7%, 11% bronze, copper and silver, 2 x 2" x 20 ga. **Right** Japanese openface ingot mold

reach diffusion temperature will depend on the heat source and to what degree you apply it. Even heat is important, not speed. Work slowly and carefully. In general, the diffusions I did took 20 to 30 minutes with billets 2"x 2", consisting of 20 layers of 18-gauge metal.

Patterning and Forming. Traditional pattern development was applied to bronze mokume as well as twisting and relamination of billets with success. Various forming techniques were used with the bronze also. The laminated bronze held up well to hammer work of all kinds, forging and raising. I relaminated a billet of 20 layers consisting of 7% bronze, 11% bronze, copper and silver to make a billet of 40 layers. This billet was forged out and twisted to create star patterns. Hiroko raised a bowl made from a billet containing 6% bronze and copper with no difficulty. Also, I have dapped and raised domes with no trouble.

Coloration. The possibilities for coloring bronze mokume-gane are numerous. Any patina that has been used for copper alloys should be tried. My experiments with traditional copper alloy colorations led me to produce a great range of colors new to mokume-gane, from iridescent rainbow spectrums and vivid green-blues to golds and natural browns. Coloration of copper and copper alloys used in patterned metals is still open to much experimentation.

One coloration I achieved with rokusho involved a billet of 7% tin bronze, 11% tin bronze and copper. The 11% turned gold, the 7% turned light gold-brown and the copper deep brown. A very nice color combination is achieved by diffusing a higher tin bronze, such as 10%, with kuromi-do and color with rokusho. This produces a deep gold color in the bronze with the black of the kuromi-do. The high contrast of this combination is beautiful. Other colorations resulted from using liver of sulphur, shown on Table I. The bronze mokume can also be left to color naturally from oxidation, giving deep to goldish browns.

In conclusion, bronze consisting of copper and tin, within a certain tin percentage range, can be diffused and manipulated into patterned metal. When working with copper-tin bronze, the work must be done slowly, properly and carefully. The table provided here is meant to aid in planning a billet and to help determine melting points. It lists several alloys with their working qualities and some coloration information. ■

Notes

1. Members of the Graduate Program, Southern Illinois University/Carbondale; compiled and edited by W. Ard, "Return to the Forge (Extended Research into Mokume-Gane and Granulation)," *Goldsmiths Journal,* August 1979, reprinted in *Metalsmith Papers of the Society of North American Goldsmiths,* 1981

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Update II
18K Gold Mokume-Gane

by Steven Kretchmer

Mokume-gane is made of metals of different compositions that are laminated by diffusion, manipulated and colored to create exciting patterns. Traditionally, mokume-gane is done with metals that need chemical treatment to bring out the colors. I felt that mokume-gane could be done in alloys that have different colors inherent in their composition and need not be patinaed, therefore being more suitable for jewelry.

For years I had imagined swirling colors of gold and was determined to make some that could be used as metal stock for unique jewelry pieces. The rarity, beauty and noncorrosive nature of gold makes it universally desirable. Karat gold has a wide range of colors and can now be diffused and patterned like other metal laminates. I prefer 18-karat alloys for their rich color and workability.

Compatible golds for a mokume-gane billet must be diffusible and able to move at the same rate. That is, once diffused, they have to forge, roll out, twist or bend without layers shearing one from another due to different malleabilities.

Alloys. Eighteen-karat golds can be alloyed to offer a variety of colors. Some 18-karat alloys, compatible for diffusion are shown in Table II. Melting temperatures given in the table were derived from sources in *References* and may vary. Note that pure platinum can be diffused with gold, but the alloy at the diffusion plane is too brittle for manipulation. It can be used for a striped pattern. Using the listed alloys, the high contrast combination is green, red and white. A more subtle and overall golden color may be made with yellow, pink and white.

Alloying. The pure materials for an alloy are weighed out into the proper proportions and set aside. A vertical ingot mold is used. (An open mold is not used because it results in an ingot with a "top" and a "bottom" with varying porosities.) The mold is smoked with soot on the inside to prevent the gold from adhering. The mold is then set and propped at a slant to allow the metal to enter with very little turbulence, just as beer poured down the side of a tilted mug prevents foaming. It is a good idea to preheat the mold to vaporize any residual moisture to prevent explosion when the molten alloy is poured.

An open melting crucible containing the metal is held in a crucible holder. Keep separate crucibles for different colors in order to prevent gold residue from changing the colors of a new alloy. The palladium-gold alloy residue would become inclusions in the other alloys because it has a much higher melting temperature. The metal is melted using borax as a flux to prevent oxidation and to break the surface tension of the metal when melting.

It is best to start by melting the metal with the highest melt-

Table I Bronze Mokume-Gane

		Malleability		Natural Color			
Tin Content	Melting Point C°	Hot	Cold	Sand Paper Finish	Air Oxidized	Color by Rokusho	Color by Liver of Sulphur
0% (copper)	1084	Excellent	Excellent	Pink—Light Red	Brown	Orange to Brown	Deep Gray
5%	1050	Very Good	Very Good	Yellow Red	Light Yellow Brown	Yellow Ochre	Gray Red Brown
10%	1020	Good	Good	Gold Yellow	Yellow Brown	Deep Gold	Deep Red Brown
15%	960	Good	Fair	Light Gold	Light Yellow Brown	Yellow Gold	Red Brown
20%	900	Fair	Poor	White	Light Yellow	Yellow White	Purple Red Brown
Kuromi-do	1070	Excellent	Excellent	Pink—Light Red	Brown	Dark Bown Black	Black

ing point, then the next highest and so on. For example, when alloying yellow gold, melt the copper, and the gold, then the silver. Use a neutral, nonoxidizing flame, hot enough to melt fast, but using a rich enough mixture to prevent unnecessary oxidation. During the melting, add a little pinch of flux now and then. Encompass the metal with the flame throughout the process to prevent any air from attacking the more corrosible metals, but keep the flame out of the way when salting with the borax to allow the powder to melt onto the metal and crucible and not be blown away by the force of the flame. Stir the alloy by jiggling and rocking the molten metal contained in the crucible until it is well mixed. Enveloping the metal in flame, lift the crucible to the opening of the tilted ingot mold. Add a sprinkle of borax and pour *through* the flame into the mold. The flame should cover the metal, the lip of the crucible and the opening of the ingot mold. It should be poured quickly, but not dumped. This assures a consistent metal without splashing or trapping air. Overheated molten metal will pour out to an overly porous ingot, and underheated metal will not pour well at all. A bad ingot can be remelted. It might take a little experience to arrive consistently at an optimum ingot. With a good ingot the next step is to roll it into a sheet.

Preparation of Layers. The ingot is pickled and the flashing filed off. Roll the metal in one lengthwise direction to the desired thickness, annealing before the edges of the sheet begin to show very tiny cracks. (Sensing this point comes with experience.) The metal must be bubble-free. If not, blisters will show up during annealing. All of the alloys listed can be quenched in denatured alcohol after annealing. Alcohol is a slower quench than water, more appropriate for annealing these gold alloys. A metal container with a lid for the alcohol works fine. (Beware that alcohol can ignite from the red-hot metal. In case of ignition, one should be prepared to calmly cover the container with the lid.) The rolled strip is cut to length and flattened for the billet. Layers are sanded on both sides with 320-grit paper, and care is taken not to get fingerprints on the surface.

Stacking. Stacking order is important. Any two aforementioned alloys are compatible for diffusion, but when a third alloy is introduced, the procedure becomes more complex. A metal with a lower melting temperature must surround that of the highest and be diffused into separate three-layer stacks. Then a second diffusion must be done to introduce the third alloy of the other melting temperature between the three-layer stacks. This assures crisp color definition.

Diffusing. Layers are tightly bound with double-twisted binding wire. A torque plate is too massive and it is difficult to accurately monitor a one- or two-ounce billet if the edges are not very well visible. The billet is diffused in the normal reduction atmosphere used in the mokume-gane process, and a torch can be used for small quantities. It is heated evenly and thoroughly until fusion becomes visible around the edges. Care should be taken when heating the billet to avoid melting and thus destroying it.

Conclusion. Having successfully used gold in the mokume-gane process, I can now integrate traditional goldsmithing techniques in making jewelry with patterned gold. Research continues with other colored 18-karat golds. Patterns that have been explored in ferrous and nonferrous materials for centuries can now also be explored with precious metals to expand the possibilities of jewelry design. ■

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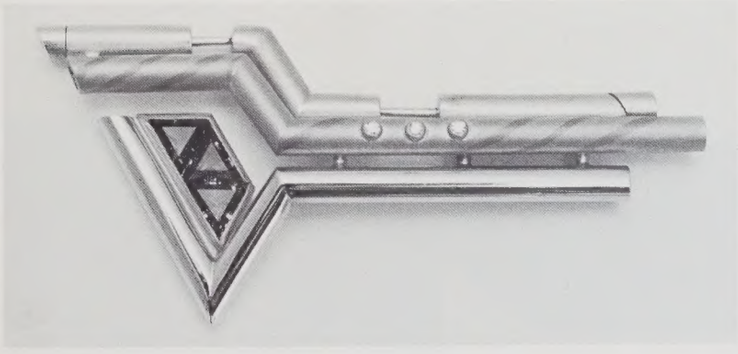
Update II
Mokume-Gane Pattern Research

by Ruth Taubman

The literal translation of mokume-gane is wood-grain metal, a description of the traditional patterns of Japanese alloys laminated by diffusion. Pattern is achieved by alternate cycles of removal of metal by hand carving or chiseling and hot forging to expose layers of contrasting color. This method of patterning results in an organic linear design, thus the relation to wood grain.

Limitless variation is possible in both the design and method of producing patterns. The first step is to decide on the composition of the billet to be patterned. The alloy, gauge and amount of laminates to be diffused must be determined by esthetic and technical considerations. For example, visually, a bold pattern may require stark color contrast, variation in line thickness and varying numbers of each metal. However, choice is limited by compatible melting points and malleability among the components of the billet. The next step is to devise a method of exposing the various layers of a diffused billet. This research centers on two methods of patterning: patterns produced by use of a milling machine and those produced by end-grain forging. The following details



Left Steven Kretchmer, *Bow Peace Pin,* 18k golds: yellow, blue, palladium white, nickel white; 24k gold, tourmaline, diamonds, 55 x 51mm. **Above** Steven Kretchmer, *Tubular Pin,* 18k golds: yellow, pink, palladium white, nickel white; 14k gold, citrines, amethyst, diamonds, 29 x 63mm

Table II Alloys

		Proportion of Composition by Weight				
Malleability	Color	Au/1000	Pd/1000	Ag/1000	Cu/1000	Melting Temp C°
1 Most	Green	750		230	20	975
2	White	750	250			1400
3	Yellow	750		170	80	925
4	Pink	750		80	170	882
5 Least	Red	750		20	230	885

the method and materials used to achieve the machined grid and zigzag patterns and the hand-forged single diffusion and rediffused patterns featured in this article, hereafter referred to as patterns A, B, C and D, respectively.

Preparations for Milling. Several objectives were encompassed in the investigation of machined patterns. The two primary concerns were to produce a controlled, dense pattern and move away from traditional organic pattern forms. In using a milling machine, the depth and direction of each cut can be controlled with a precision not possible in even the most tedious handwork.

The standard billet used in the milling process was a 16-layer diffusion of alternately arranged 18-gauge copper and kuromi-do, a Japanese alloy of 99% copper and 1% metal arsenic. These components were chosen for their similarity in melting points and handling properties, as well as their color difference to facilitate clear depiction of results. The billet's initial thickness was reduced by hot forging and then cold rolled to 1/8". It is necessary to roll the metal in order to achieve a uniform thickness to be milled. Variations will produce an uneven depth of cut. The billet was not annealed after the final rolling, as "crisper" metal produces a cleaner cut. Parallel edges of the billet were cut and filed to attain an exact width. The piece was then clamped in the mill's vise on edge and the cut sides were trued with a square end bit to provide a flush fit when secured in place for cutting. Steel bars measuring slightly less than the width of the billet were stacked beneath it in the vise to raise it to the proper height and prevent the billet from bending under the pressure of the cut.

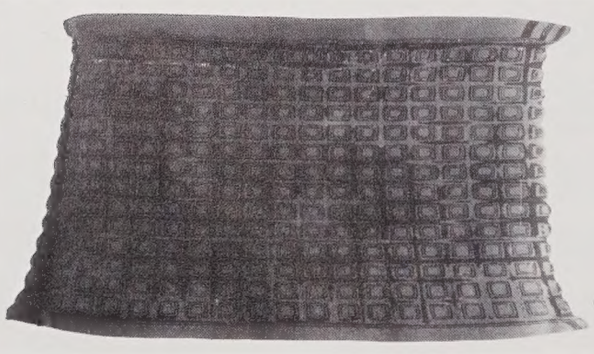
Milling Procedure. A Bridgeport vertical mill, circa WWII, was my workhorse. The Bridgeport's speed and direction of cuts are controlled manually along perpendicular axes. One complete revolution of each directional control produces a cut 2/10" in length (this increment was used as the module for pattern B). The first tests on the mill were done on a piece of 1/8" copper, as it had virtually the identical properties of a copper/kuromi-do billet. This allowed practice without having to produce an extra diffusion. A 1/8" two-flute ball-end mill bit with a 3/8" shank was used for the initial cutting work. Following the destruction of several bits, it became apparent that a noncarbide tool would not withstand the wear of milling copper. Carbide mill bits are generally available only with flute and shank of equal size. Many mills' chucks will not close down far enough for fine cutting bits. A device called a collet will adapt a chuck for smaller bits.

The size of a cut is determined by several factors. If a billet is to be milled on both sides, the depth of each cut should not exceed one-quarter of the total thickness of the billet. A billet milled on one surface may be cut to a depth one-half the thickness. The depth of the cut is limited by the measure of the radius of the ball-end bit. Therefore, a 1/8" bit produces a cut 1/16" deep and 1/8" wide. Cutting deeper than the curve of the bit produces a trench with straight walls. This condition should be avoided, as straight sides will fold in when forged. These undercuts will eventually appear as surface cracks which must be ground or filed out, destroying or obscuring the desired pattern. Ideally, a cut should be a shallow, rounded gutter. This configuration exposes as many layers as possible, rendering a dense, rich pattern. With an objective of revealing multiple strata with the least amount of cutting, a billet for milling should be no more than 1/8" thick.

A billet is patterned by a series of shallow cuts to attain a specific final depth. Each course of metal removal should not exceed .015", or 1/64", in depth. This measure is optimal for both a smooth cut and maintaining a sharp bit. The key to cutting on a milling machine, however, is speed. The motor speed for all cuts preceding the final course should be 600–800rpm. The final cut should be done at 1,000rpm, as this gives a very clean cut and smooths out any slight ridges produced by the bit during previous cuts. Another factor is the speed at which the bit is moved through the piece. This can be summed up in one word: *slowly*. The primary causes of dulling bits are pushing the bit too quickly and inadequate lubrication. There should be no sign of bending as the bit goes through the metal. Basically, one has to get a feel for letting the bit eat through the metal. For those familiar with machining steel, copper alloys are much "stickier" and tend to gum up the bit. It is therefore very important to liberally and constantly lubricate the work with a light cutting solution, for example, 50/50 kerosene and cutting oil. In addition, cut particles and shavings should be frequently brushed away to provide a clear cutting path. Any burrs which remain upon the completion of milling should be removed from the billet before it is reduced to sheet.

Proximity of cuts differs between hand and milling machine patterning. Hand-cut patterns result from repeated courses of cutting and forging. A billet is often lightly etched or colored between cuttings to reveal unpatterned areas which are subsequently chiseled or drilled. The density of the pattern develops in a progression. Machined patterns are reduced to final sheet thickness after one course of cutting is completed. For this reason, a pattern must be preplanned and cuts made very close together. When designing a pattern, it is important to consider the amount that the billet will spread from the milled thickness to a particular sheet gauge. It is difficult to remill a billet after it has been partially rolled down, as it is too thin. If a dense pattern is desired, leave as little uncut surface area as possible.

Pattern A was based on a grid 3/16" on center. Each cut was 1/8" wide by 1/16" deep. The uncut surface which remains from this cutting pattern appears as raised squares resembling a miniature waffle



Pattern A

Pattern B

Pattern C

iron. Each of these squares measured 1/16″ by 1/16″. The final pattern appears as a rectangular grid due to the limitations of a 5″ wide rolling mill used to flatten the billet (see Pattern A illustration). Thus, to achieve an 18-gauge sheet, the billet was stretched farther in one direction. If rolled on the bias, a diamond pattern would result. The mottled appearance of black among the concentric rectangles is a result of a variation in the depth of the cut by one layer. While unintentional, this tends to lend a softer, more interesting look to a very ordered structure. A total of seven to eight layers are visible.

Guide lines were scribed on the surface of the billet at 3/16″ intervals. Each cut was made in four passes of 1/64″ increment depth each for a total depth of 1/16″. The bit was successively lowered 1/64″ after all lines were cut in one direction. This procedure was repeated until the total desired depth was reached. The entire procedure was repeated for the lines perpendicular to the first course of cuts.

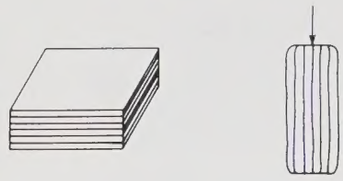
Pattern B was based on a "step" pattern. Each row was cut in perpendicular segments measuring .2″ in length. This distance resulted from one complete turn of each xy axis movement control and was therefore chosen as an easily measured module. The distance between each row was .15″ on center. Each was 1/8″ wide by 3/64″ deep made in three passes, 1/64″ deep each. A total of three to six layers was visible. The billet was reduced to a sheet by running it through a rolling mill at a 45° angle to the cutting pattern, thus stretching the perpendicular "steps" to 105° angle zigzags (see Pattern B illustration).

Hand-Forged Patterns. In exploring hand-forged patterns, my goal was to produce a pattern without removing metal from the billet. The impetus for developing this process came from observing the labor of my peers produce alloys which were used in diffusions that were drill or chisel patterned. Approximately 30% to 40% of the metal in the billet was carved away in order to create a pattern. It seemed less labor would be involved in producing mokume-gane from hand-alloyed laminates if one did not have to make extra metal to compensate for that which would be carved away. This particularly holds true for alloys incorporating precious metals, as any metal which was removed in patterning would subsequently require additional time or money to refine the precious components. End-grain hot forging of a diffused billet fulfilled the objective of eliminating metal removal to create pattern.

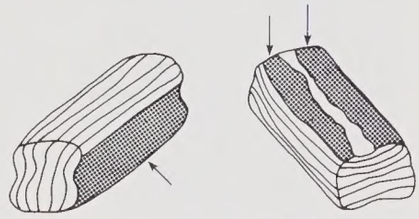
Patterns C and D are both a result of the same procedure of end-grain forging, differing in number of layers. The billet for pattern C was a 16-layer diffusion of alternately arranged 18-gauge copper and kuromi-do. The billet for pattern D was a result of rediffusion. An original 16-layer billet of 18-gauge copper and kuromi-do was diffused and reduced by hot forging to 14 gauge. This sheet was cut into six 2″ by 2″ pieces and rediffused. Thus, the rediffused billet for pattern D was 96 layers. ■

Production of Patterns C and D

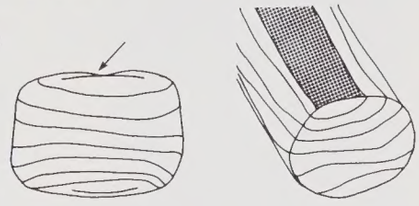
1. Diffused billet—edges removed and filed smooth.
2. Edges rounded, billet hit on one side.



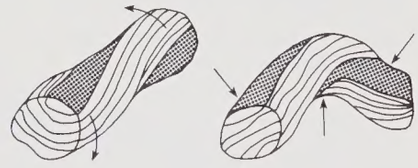
3. Square elongates to rectangle, some caving in results on sides.
4. Rounded bar formed by striking edges to remove caving.



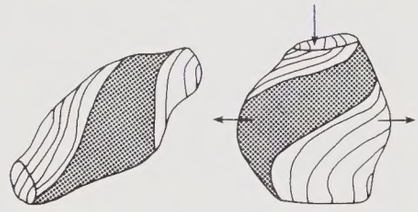
5. Undercuts which may result from step 4 must be ground away.
6. Bar rounded further.



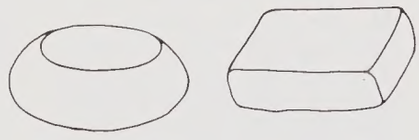
7. Twisting begun by hitting ends in opposite directions, as bar is too thick to twist in a vice.
8. Distortion of layers increased by continued bending and forging.



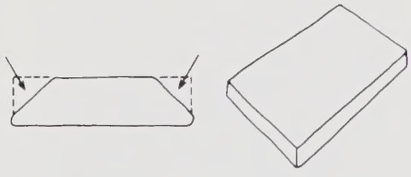
9. Ends forged smaller and rounded.
10. Billet set on end and forged, causing center to spread outwards.



11. Thick plug formed.
12. Rectangle formed.



13. Parallel edges beveled.
14. Trapezoidal form forged to rectangle or square of approximately 12 to 14 gauge.



15. Sheet cold-rolled to desired gauge, annealed as necessary.

Pattern D detail

Mokume Meltdown at Carbondale

by Stephen A. Walker

In January of 1982, Southern Illinois University at Carbondale hosted a National Endowment for the Arts-sponsored workshop on mokume-gane. SIUC has for six years engaged in ongoing research into the mokume-gane process and its applications. The results of previous SIUC research have been published in "Return to the Forge," Goldsmiths Journal, *August, 1979 (reprinted in* Metalsmith Papers, *1981),* Metalsmith, *Winter, 1981. The purpose of this workshop was to bring together innovative artists in the field, as well as to disseminate information to a larger group of participants consisting of representatives of prominent university metalsmithing faculties from across the nation and current SIUC graduate students.*

The workshop functioned in a spirit of experimentation and inquiry. Previous investigations in mokume have revealed a great deal about this process, but have also produced a tangled web of theories, procedures, rules and practices with varying degrees of validity. At the beginning of the workshop it was clear that each practitioner of the mokume process adhered to a particular set of rules, often quite different from one another. As the workshop progressed, a great deal was learned about what really is necessary to make successful mokume and what is needless or redundant. By polling the participants after the workshop and conducting a systematic comparison of about 40 billets, it has been possible to further clarify the results.

Attending the workshop were: Al Ching, Garret DeRuiter, Phillip Fike, Richard Helzer, Mary Lee Hu, Thomas Markusen and Kurt Matzdorf. SIUC graduates Phillip Baldwin, Marvin Jensen and Michelle Crespi, all of whom contributed to mokume research at Carbondale, attended the workshop, as well as current SIUC students. Professors Brent Kington and Richard Mawdsley of SIUC were the hosts. The participants of the workshop were paired so that each visiting instructor worked with an SIUC student. Each team made at least three mokume billets during the course of the six-day workshop.

The workshop involved introductory discussions of the various procedures followed by hands-on experience in the studio. The discussion/lectures were far from step-by-step instructions. Several optional methods were explained, and the teams tried the methods that seemed most sensible to them.

Preparation of Metals. The first step to be explored was preparation of metals for laminating. Commercially available sheet stock was used for the first billet. Thanks to research by Phillip Baldwin, the usefulness of readily available commercial alloy sheet stock has been made known. The workshop used red brass (Copper Development Association alloy #230), yellow brass (CDA #260), naval bronze (CDA #464), nickel silver (CDA #752), oxygen-free copper (CDA #102) and copper (CDA #110). The workshop used the oxygen-free copper for making traditional Japanese alloys. Also useful are Everdur silica bronze (CDA #655) and cupro-nickel alloys CDA #706 and 715. All these alloys are available from sheet metal firms in this country and are hot forgeable. It should be noted that these are all *un*leaded alloys.

Traditionally, sheets are prepared by a tedious, seemingly endless, process, involving annealing, pickling, flattening and sanding with abrasive papers to achieve a very fine surface. Thanks to those who are always looking for an easier way, some minimally time-consuming procedures have been discovered which adequately prepare the surface for bonding.

The least time-consuming sheet preparation method is sandblasting. We found a glass-bead blaster satisfactory for cleaning the oxides and dirt from the surface in a short time. The second method of cleaning sheet was a strong acid dip. We used a nitric acid solution of from 50% to 25% for several seconds, with a rinse in baking soda and water. It was dried quickly to retard further oxidation of the clean metal. A third method of cleaning sheet, closer to the traditional method, may be preferred by many craftsmen, since it doesn't require the expense of a sandblaster nor the risk of exposure to acid and fumes. The sheets are pickled in Sparex to remove oxides and then scrubbed with a scouring powder, such as pumice or rotten stone (sometimes with a little detergent). Again, they are rinsed and dried quickly.

When using torque plates to clamp the metals to be fused, it is not necessary to anneal the sheet in preparation; moreover, the metal sheets need not be absolutely flat, since the pressure from the plates will insure complete surface contact.

Laminations. The most consistently successful bonding technique was to place the stack in tightly bolted torque plates in a preheated kiln. The temperature should be no higher than 100°F below the lowest melting point of the alloys in the stack, but should be near this maximum. Most alloys used will dependably bond at 1500°F and under pressure will bond at much lower temperatures. However, for complete bonding and low risk of failure, temperatures near the maximum are best. After the billet has risen to bonding temperature it is very important to maintain it there for at least half an hour. For a 3" by 3" billet, 2" thick, in ½" steel torque plates, a heat-soak time of 1½ hours is recommended. It is possible to fuse billets in much shorter times, but this results in a higher rate of failure.

After the billet is removed from the kiln, most teams proceeded in the following manner. The billet in its torque plates was placed in a vise and quickly squeezed. Billets with alloys having lower melting points, or silver, tend to "sweat" a molten or semimolten flow of metal. These should be squeezed hard. We were able to get as much as ⅛" compression by doing this. After being squeezed, the billet is returned to the kiln for reheating. Then the plates are removed and hot forging begins. The necessity of keeping the metal hot varies from alloy to alloy. Some alloys, especially nickel silver, tend to split apart if they are allowed to cool before they are forged. In any case, it is recommended that the billet be forged to one-half its original thickness before it is allowed to cool. Alloys containing more than 10% silver are "hot-short" and will crack if forged at red heat. These alloys and the billets containing them should be forged at a black heat. (To determine a black heat, the metal should be heated to a dull red and cooled until the glow is no longer visible. It is then safe to forge.) Hot-forgeable alloys are best forged at a red or yellow heat.

A tally of the failures shows that the most common cause of delamination was insufficient heat or heat for too short a period of time. Allowing the billet to cool prior to forging was also implicated in several partial failures, as it caused cracking, especially along nickel silver layers. Several billets were left too long in too hot a kiln, so that the alloys with low melting points melted out.

Alloying. The workshop also dealt with the mixing and pouring of traditional Japanese alloys and with forging and rolling these into usable sheet. Shibuishi alloys were poured using graphite crucibles in coal forges and 10-ounce or 30-ounce steel ingot molds. The constituent quantities of oxygen-free copper and silver were placed in a preheated crucible and covered with a firebrick lid. As the metal melted, a small handful of lump charcoal was added to the crucible to aid in the absorption of gases, particularly oxygen. When the metal was melted, it was poured into the mold, which was heated only enough to drive off moisture. This allows the metal to chill as quickly as possible and retards the growth of large crystal structure. If the surface of the ingot is similar to the surface of a galvanized pail and large crystals are visible, the metal was poured too hot and will be prone to cracking. An ingot such as this should be remelted.

Ingots are best reduced to sheet if they are hot forged prior to rolling. The time it takes to reduce the cross-section of a plate is much shorter if done by hot forging than by rolling. This is especially true if power hammers are available. Perhaps more important than the time factor is the change in the crystal structure that hot forging causes. The crystals of the metal are broken into smaller crystals during forging, making a metal body which is more plastic and less prone to cracking than a brittle, cast crystal structure. Cracking is less likely if the hammer blows begin at the edge of the ingot and move in. Some metalsmiths prefer to do a course or two by hand prior to using a power hammer.

Handmade sheet is often characterized by hairline cracks and blisters. Some very coarse sheets have been successfully used in mokume billets; the blisters and cracks will fuse during the lamination. Scratched or gouged sheet can also be used with little risk. ■

Stephen A. Walker is a graduate student in metals at S.I.U.

Exhibition Reviews

Harriete Estel Berman: The Family of Appliances You Can Believe In
California Crafts Museum, Palo Alto, CA
June 15-August 29, 1982
by Christina Oberst Henrikson

Harriete Berman's new series of sculpture satirizes traditional roles in contemporary life. Ten domestic "appliances," from vacuum cleaners to waffle irons shown here, created visual metaphors of society's expectations and current transitions. Each sculpture illustrated the conflict between adult realizations and idealized childhood fantasies of a woman's role.

The first piece encountered upon entering the show, which had all the subtle suggestions of an appliance store, was the mandatory household blender, transformed into the *Womanizer, Kitchen Queen*. While a jewel-like quality was present in this work, prettiness of detail did not detract from the content. A pirouetting music-box ballerina replaced the blender's blades; the plastic lid was transformed into a crown which read "Misstress of the Home" and the control buttons not only offered to mix, blend and stir, but love, honor and obey. Focusing the sculpture's meaning, the titles became an integral part of the presentation—a technique Berman uses consistently throughout the show.

Perhaps the most subtle of the sculptures in the exhibit was *Living in A Vacuum*. Similar to an old Eureka vacuum cleaner, this piece was constructed from copper tubing painted with gray enamel. On each side of the piece red acetate could be seen through the nickel-plated trim, which was pierced to reveal the sculpture's name. Like many of Berman's other "appliances," the vacuum cleaner had operational features and a surprising interior world. When the end of the vacuum cleaner was opened, a small room with an etched copper floor was revealed. Inside the room was a staircase and a switch which operated a light in the recessed interior. Despite the small scale of the vacuum, the interior room was uncomfortably empty. The only piece of furniture was a chair isolated from the rest of the room. Sitting by itself, too large to fit inside, the chair faced the room and staircase across from it. The staircase led upward only to come back to the same sloping floor of the starkly empty room.

While Berman's works predominantly deal with women's misconceptions and disappointment with their adult roles, this piece transcended strictly feminine concerns, capturing a strong sense of loneliness and reflecting mankind's isolation in modern technological society.

Just as the preciousness of their small scale did not detract from the content of Berman's sculptures, neither did the content overpower the viewer's appreciation for her technical ability. Each sculpture was superb technically. Even found objects occasionally used were altered slightly to make them Berman's own and imaginatively integrated with the metalwork.

Quilted Iron and Honeycomb, "True Grid" exemplified Berman's fabrication process. Like her other works, the piece began as a copper construction, which was then nickel plated. To maintain its realistic 1950's appearance several parts were borrowed from an old waffle iron and added to the basic structure. Among the additions were a black nylon handle, altered in size and shape to fit the sculpture's dimensions, a large red plastic gem which served as an "on/off" light and four small black nylon legs. The most obvious prefabricated objects, however, were the two circular aluminum waffle griddles, polished to a mirror finish. Although the exterior appeared to be an "ordinary" waffle iron, much like the development of a personal relationship, the really significant content was revealed by a surprising interior world. The waffle griddles, serving as partitions, lifted up to reveal another level. Quilted, peach-colored satin lined the inside of both the top and bottom exterior shells. Inside the top shell, the embroidered phrase "Look how happy we are" ironically emphasized the forced attempt at happiness required to hide real feelings from the rest of society. Inside the bottom shell, the same peach-colored satin lining was heaped with an assortment of fluffy, satin pillows, reminiscent of a honeymoon suite. What one expected to be a soft, sensual scene was disrupted by four relatively large coils springing out of the bed, a combined metaphor representing the heating element of the waffle iron and the realities of marriage.

Harriete Berman's sculptures in "The Family of Applicances You Can Believe In" have an obvious feminist perspective, but they transcend their didactic nature to make a universal artistic statement. As familiar household appliances, they cater to middle-class commercial values and manners; but by building on that readymade iconography, Berman adds layer upon layer of symbolic references. The results are artwork that carefully maintain the tension between realism and biting irony through Berman's skill as a metalsmith and her eye as an artist.

This work will travel to the Triton Museum of Art, Santa Clara, CA, March 12-April 10, 1983.

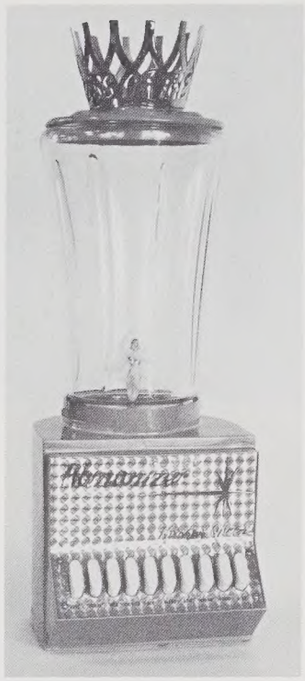
Florence Resnikoff: New Metals, New Works
Graduate Center Gallery, California College of Arts and Crafts, Oakland, CA
October 10-29, 1982
by Lynda Watson-Abbott

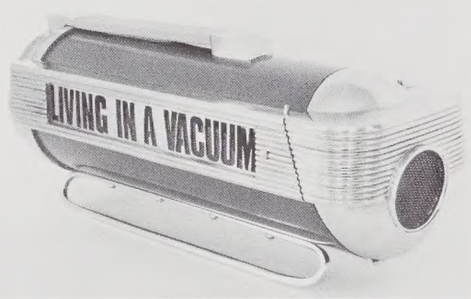
Florence Resnikoff has a strong interest in color and a well-developed ability to use it in her work. The energy and concentration involved in the making was very apparent in the viewing. The colors, materials and nonstatic shapes were exciting and invited investigation.

This exhibition consisted of a recently executed series of seemingly different, yet relatable pieces, ranging from bronze sculpture to a titanium wall piece. Although there were several electroformed container shapes, the majority of the work was wearable jewelry: earrings, neckpieces and pins.

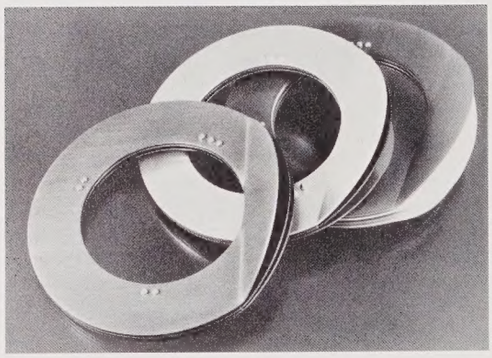
The most successful pieces in the exhibition were the pins and neckpieces which combined anodized titanium with other materials, both metallic and stone. The pins from the *Dot Series* and *California Fault* were especially effective. The titanium panels and other parts were treated in a less than self-conscious manner contributing equally with parts made from other materials to the final piece. Resnikoff's first concern seemed to be the composition as a whole, and the pieces did not attempt to be technical wonders or excruciatingly complex concepts. The colored titanium sections afforded a spontaneity—loose, freely painted, with the character of vibrant transparent watercolor. The refractory metals were used in several forms—as wire, thin and thick sheet and rod, often used on the same piece. This seemed to reduce the preciousness of the effect, made it more believable as a material and integrated it with the rest of the piece.

The most recent work combined the titanium in softly folded, rippled ribbon shapes with some beautiful large Pi-shaped stones of carnelian, rose quartz and jade. Other metals and stones were used in these compositions (neckpieces). The colors were carefully combined and controlled and the results very elegant. The variations in surface and transparency among the components added considerable depth and dimension. All of the jewelry in the exhibition looked comfortably wearable, as Resnikoff considers making wearable jewelry a challenge, not a compromise.





Top Harriete Estel Berman, *Womanizer, Kitchen Queen,* painted copper and nu-gold, 15" h. **Center** Harriete Estel Berman, *Living in a Vacuum,* copper and brass with nickel plate or paint, acetate, 15" l. Photos: the artist. **Above** Florence Resnikoff, *Multi-Dot Pin,* anodized tantalum, sterling silver, silvergilt, sodalite balls, cultured pearl, 6 x 2½". Photo: George Resnikoff



Top Sharon Church, *Neckring,* mahogany, ebony, rosewood, padauk, purpleheart, 6 x 7". Photo: Mark McCarty. **Center** David Tisdale, *Bangles,* anodized aluminum. **Above** Sandra Parmer Zilker, *Neckpiece,* sterling silver, brass, vermeil, acrylic, rubber hose, synthetic stones

The electroformed containers were less successful than the jewelry, but some beautiful colored effects were obtained by oven oxidizing the copper and adding elements of colored titanium as panels or handle shapes. The titanium was also used to contrast with the earthy surface and color of cast bronze in two sculptural pieces.

The part played by the refractory metals in this body of work was refreshing. Rather than being static materials to be colored and ogled, they became participating elements with shape and color—and not the same shape and color each time.

When viewed observantly, the exhibition revealed the development of new ideas from one piece or series of pieces to the next. All of the work was done in a short period of time, allowing the carryover to be visible and the insight into contributing thought processes to be observed.

Sharon Church
Concepts, Carmel, CA
October 15-November 19, 1982
by Aleris Zeitler

Sharon Church's one-person show provided a coherent statement about American metalwork today. Church pays close attention to the comfort, weight and wearability of each piece, with an emphasis on three-dimensional forms. Many pieces were detailed on the reverse and presented, overall, a sculptural feeling.

Her dramatic forms are tempered by full use of sensual surfaces, from silky wooden neckrings to coiled ropes of slippery beads and pearls. Many textural avenues are explored, from patterned painted surfaces, to high-polish silver and ivory, to matte black oxidized silver.

A contrast was apparent between Church's wooden neckrings, which have a primitive ethnic power, and her sleeker, high-tech pieces, incorporating orbiting forms of silver and ivory held together by movable rings. A third direction is provided by her coiled bead necklaces with hollow constructed clasps.

Overall, when viewing this group of work, one is reminded that the origin and success of jewelry still lies in its ability to provide adornment to the wearer.

New Wave Jewelry
Gallery 8, La Jolla, CA
November 5, 1982-January 1, 1983
by Jane Groover

Drawing from participants in the Renwick Gallery's "Good as Gold" exhibition and Rhinebeck, Gallery 8 has given us "New Wave Jewelry," which is meant to be new ideas and approaches to contemporary jewelry.

Not surprisingly, some of the more significant work in the show turned up familiar names like David Tisdale, David LaPlantz, Brigid O'Hanrahan and Gretchen Raber. Tisdale and LaPlantz continue to make the most elegant aluminum jewelry to be found. Though they have both received a good amount of attention recently, they managed to include new, fresh work in this exhibition. One does not tire of Tisdale's precisely executed and sumptuously colored bangles or of the infinite variety found in the scribed geometric brooches by LaPlantz.

Brigid O'Hanrahan and Gretchen Raber are also concerned with precision and clean geometric lines. O'Hanrahan's square bangle bracelets of sandblasted acrylic rods bent around subtly colored, machined titanium are a refreshing contrast to the garishly colored, tin foil-looking titanium jewelry that has appeared in countless boutiques and galleries recently. Raber included neckpieces, bracelets and earrings with micro-etched patterns, which were done like circuitry. They were meticulously crafted, and though the patterns specifically in the neckpieces echoed circuit boards, the pieces had a beauty which transcended any thought of modern technology.

Some of the more whimsical work in the exhibition also included the use of circuitry and even LEDs. Leo Cahn and Mathys Van Manen, the Dutch team known as LEOMAT, included a wonderful group of their brooches which are stainless steel insects whose eyes light up and whose legs seem to have enough spring for jumping. Also on the light side are Kim Bass's familiar *Clothesline With Washerwomen Pins* of karat golds, cloisonné and plique-á-jour enamel, and K. Lee Manuel's *Heart Repair Necklaces.* Manuel's acrylic painted leather pieces had an almost ritualistic look and one could have easily envisioned them as part of a native American costume of some sort. They were gloriously colorful, and, on close inspection, the painted surfaces revealed hearts, faces and a variety of mysterious symbols.

For a fleeting moment, Correen Kaufman's cloisonné brooch series could have evoked whimsy, but the miniature fans with confettilike squiggles were so exquisitely made that one could not negate the preciousness of these pastel jewels. Robin Quigley showed a series of earrings which also looked like bits of confetti, but familiarity with her one-of-a-kind resin and silver pieces made the work in this exhibition disappointing.

Mention should be made of the work of Lorelei Hämm, whose combined silver and acrylic bangle, brooch and neckpiece were a marriage of excellence in design and craftsmanship. The work included grid patterns with black, coral or purple acrylic, and each piece was a subtle balance of form and color.

The quality of the work in "New Wave Jewelry" was uneven. Perhaps the title "New Wave Jewelry" confused some of the participants and led them to believe that the exhibition would not be a significant one. Gallery 8, having been five years in its present location and four years before that on the University of California campus, is the most established craft gallery in San Diego county. The owners have attempted to and want to continue to show innovative jewelry in a town which is paved with jewelry stores filled to the brim with diamonds and gold. One can only hope that this will not be their last attempt at a jewelry show of this scale and scope and that in the future they will jury work of all participants, even when the show is invitational and they are familiar with the work of the exhibitors. In other words, what they saw in "Good as Gold" and at Rhinebeck was not necessarily what they got.

VI Biennale International L'Art de L'Email
Chapelle Du Lycee Gay-Lussac, Limoges, France
July 9-September 15, 1982
by Kathryn R. Gough

Of 800 enamels sent from 34 countries, 260 from 25 countries were juried into this wide-ranging show. Included were wall plaques, bowls and jewelry, representing every technique except grisaille. The quality of work ranged from superb and breathtaking to poor. The exhibition was well displayed in nicely lighted showcases with space around each piece. Represented by 22 participants, West Germany was the strongest country at the exhibit. The wall pieces showed the most originality. The jewelry was finely crafted, wonderful marriages of metal and enamel, although the overlap of style by several of the entrants was disconcerting.

First prize was deservedly won by G. De Kroon, Netherlands. His whimsical, yet poignant sculpture *Ornithologie* held both hidden and obvious meanings. Another Dutchman Pim Van Vliet's mystical landscapes gave a strong feeling of distance and depth. The most innovative jewelry won second prize for Mario Beusan, Yugoslavia. It gave the impression of rounded mountains by the use of textured enamel in shades of green. Unfortunately, in my opinion, the weakest part of the show was the French enamels. Many were technically well executed

but artistically trite. Spain was well represented with enamels that had a dreamlike, romantic quality.

This year the first International Forum on enameling was held in conjunction with the Biennale. Topics discussed included Enamel and Artistic Creation, Teaching of Enameling, Enameling and Craftsmanship.

Hearing the views expressed by people from various countries made me realize how much we are a product of our culture. Countries with a long history of enameling are bound by many traditions. In the Orient, the teaching and business of enamels are passed on from father to son. It's very difficult for a person interested in enameling to establish himself and sell work. The sole entrant from Korea at the Biennale was in a family enameling business. One Japanese woman told me that she wasn't able to see her work in Japan because she was not a National Treasure, a person in the art/craft field recognized by the government. Although she had had a show in a department store, she supports her craft by teaching. Pim Van Vliet, from Holland, told me, "I can't sell in my own country. They are all self-made men. They say to me, 'I can do that; tell me what you use.' " In France, mainly around and in Limoges, enamel workshops are run by a Master who does the drawing and plans the projects. These are then executed by workers or apprentices. Apprentices sign up for three years. If a person wants to do his own work, he leaves after that time; otherwise, he can stay on doing the Master's work. Some of the workshops are family businesses that have been passed on from generation to generation.

Education in enameling seems more controlled in other parts of the world than what I have experienced in the U.S. In Europe it seems to be taught only in established schools, and the teachers have to be certified in fine arts. From my experience in the U.S. anyone can offer a class in enameling, whether through adult education, the local Y or in a private studio. I heard of the many rules and regulations in France, and it made me realize how involved their government is with the arts. On several of the forum days, for example, government representatives sat at the head table and took part in the discussion.

The Biennale is organized by the local enamelists, many of whom own workshops and galleries in town. As the Biennale increases in scope, it receives financial support from the government and local businesses. The French should be commended for undertaking such a gigantic endeavor. They made it possible for enamelists from around the world to see a variety of work and discuss various aspects of working in the enamel field.

20 Years of Metal
University Museum, Faner Hall, Southern Illinois University, Carbondale, IL
August 22-September 19, 1982
by Kenneth M. Coleman

Since 1962, 47 students have graduated from the M.F.A. metals program at Southern Illinois University at Carbondale. This show marked the 20th anniversary of L. Brent Kington as a teacher in that program. The following review grew out of some four hours of recorded critique by the present graduate metals students at SIU-C,, including Chuck Schwarz, Sydney Scherr, Dan Neff, Kara Nasca, Debbie Kurpenia, Kris Gunderson and Ken Coleman.

From jewelry to pure sculpture, the objects in this exhibition reflected a variety of techniques and attitudes and covered the gamut of quality from acceptable to outstanding. More than a third of the pieces were jewelry, which, in general, was well made and highly refined. With several exceptions, the objects seemed to have been designed with an eye toward surviving the rigors of the marketplace.

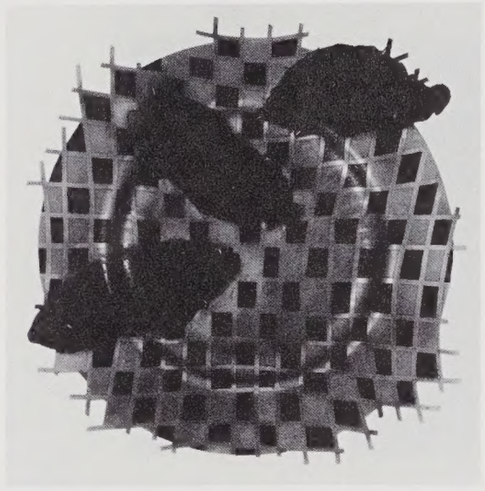
Tim Glotzbach's set of three brooches were well-thought-out compositions of interrelated geometric forms with a variety of rich surfaces. *Figure Pin* by Marci Zelmanoff, with its strong reference to Tom Wesselman's *Great American Nude* series of paintings, seemed to have accepted too many compromises when compared to her more spontaneous and dynamic *Feather Pin*. Although *Figure Pin* was a solution to a figure problem, it had a stronger personality than Glotzbach's three brooches. Michelle Crespi's two *Spiculum Pins* were small (4 x ¼ x ¼"), minimal statements that seemed to defy categorization and were, therefore, more intriguing than, say, Glotzbach's work, which illicited a more predictable response.

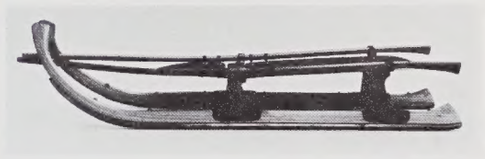
Another piece that eluded easy categorization was Harlan Butt's small enamel container *1001 Views of Mt. Mu: View #4*. His use of poetry together with a very personal and at times mystic imagery make for objects that can be dealt with on several levels. If the viewer were privy to Butt's personal mythology, more of those levels might have been accessible. However, the container did work on a purely visual level. Where Butt's work was intellectual, Richard Prillman's leaned more toward the emotional, even romantic, but it was certainly no less personal. His *Double Demon Rum* provided strong evidence of this emotional imagery, even though the chased figures of the cup section and the cast, machinelike parts of the base lacked a clear relationship. The intense, personal quality of Butt's and Prillman's work can be contrasted with Steve Walker's *Married Metals Bowls #13* and *#14*. Based on a strict design issue, these projected a more formal, almost classical dignity.

Also classical, at least in the sense of traditional blacksmithing, was Joel Schwartz's *Grille*, which was a well designed but rather predictable response to a grill problem. Robert Griffith's *Painted Form* represented a break from that tradition. The 10 x 14" steel form bore no evidence of having been worked. The airbrushed geometric motifs on the surface further removed the piece from limiting preconceptions about blacksmithing. On the other hand, the relationship of the painted shapes to the form was questionable. In contrast to Griffith's *Painted Form* was Bernard Hosey's *Nova Scotia Boat Series #3*. In this forged steel piece the form, especially the joint details, was a result of controlled technique. Form, detail and surface combined to make a cohesive statement.

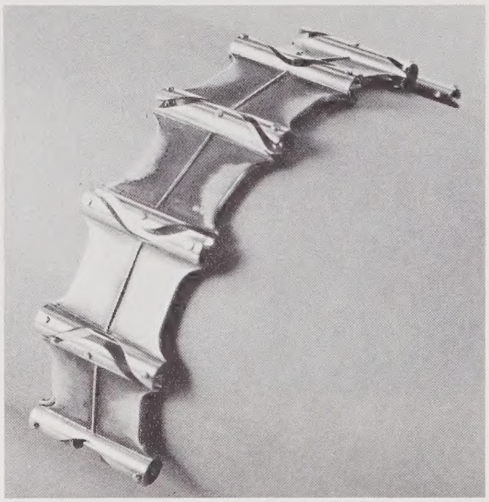
The work of two other individuals represented objects in which the form was controlled, or at least influenced by technique. *Rainbow Race to "O"*, a sculpture by Bill Leth, depended on the sensitive combination of materials which were joined and manipulated by machine. Leth used the machine technology but moved beyond it in the pursuit of his idea. Randy Jones's machined stainless steel gavels employed fascinating joinery and detailing of some interest together with wooden handles—all of which reflected a straightforward machine esthetic—in an effort to present objects with visual character. In contrast to Leth, however, Jones's infatuation with and control of machine technology appeared to impede the pursuit of his idea; the objects were hampered in realizing their full potential.

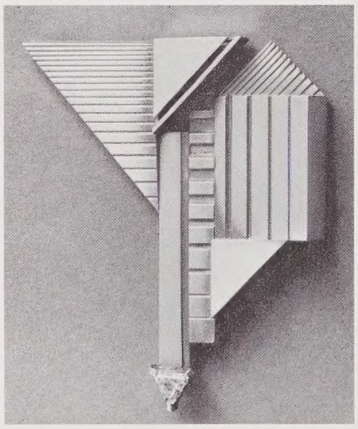
Another piece that combined wood and steel in a functional format was Jim Wallace's *Sled VI*, where a strong concern for utility combined successfully with the graceful, aerodynamic forms needed for speed and sleekness. In comparison to Wallace's sled were Jan Brooks Loyd's plate pieces and Michael Croft's set of *Bitty Blades*. While in both instances the works referred to functional objects, each went beyond those objects. The plates were more than plates and although the blades had edges and would cut, they were not merely knives. The strong presence of Wallace's sled was deeply rooted in the quality of "sledness"; for him, the connection to function seemed to be primary. Loyd's plates and Croft's blades, on the other hand, obtained much of their strength





Top Capalleja Vilasis, *Wall Plaque*, enamel. **Center** Jan Brooks Loyd, *Chicken with Stickers on a Dirty Tablecloth*, mild steel, sterling silver, 12½ x 12½ x 1". **Below Center** James Wallace, *Sled VI*, steel, wood, fiberglass, 48 x 18 x 16". **Above** Heikki Seppä, *The Awe*, sterling silver, 8" h.





Top Klaus Ullrich, *Armband,* silver, gold, steel. **Center** Deborah Aguado, *Facade II,* sterling silver, 18k and 14k gold, cubic zirconia. **Below Center** Suzanne Lindahl, *Necklace and Pin.* **Above** Eric Lofman, *Coffeepot*

from moving beyond the quality of "plateness" or "bladeness." For them, the connection to function seemed to be secondary.

There were several other metalsmiths whose works were significant, not only in terms of this particular exhibition, but also because of their contributions to the field of metalsmithing in general. Both Mary Lee Hu and Gary Noffke, for example, showed work that indicated mature ideas as well as continued exploration and growth.

As a show, *20 Years of Metal* was held together by its diversity and its confidence, rather than by the fact that all participants were students of the same teacher. There was no evidence of an imposed esthetic, no "school style." What was evident was an obvious striving for quality and for individuality. An exhibition of this caliber is possible only because of a program that strongly encourages its participants to develop their own styles and methods and to seek their own personal level of achievement.

Heikki Seppä
Ten Arrow Gallery, Cambridge, MA
September 13-October 19, 1982
by Paula Dinneen

For the Boston audience this show of Heikki Seppä's work proved to be a rare and special occasion. Well known to the student and connoisseur of contemporary metalsmithing, Seppä's "hollow form" techniques and unique descriptive vocabulary have liberated the three-dimensional form from its traditional functionality and paved the way for much of today's experimental work in the field of metalsmithing. For Boston's gallery-hopping public this show provided the uncommon opportunity to encounter craft of vision and breadth.

Seppä showed some 30 pieces—both jewelry and sculptural forms. Because this was my first time seeing Seppä's work in other than photo form, I was unprepared for its visually resonating impact. The dynamic interaction which these pieces project as a group is titillating to the viewer, which made me wonder why over the years I had only heard about Seppä's work in terms of its technical mastery. Indeed, its technique is perfected, in fact awe-inspiring, however, it is clearly the metaphor which allows it to remain work of vision and substance. Each piece can be assimilated and personalized by the viewer in a number of ways. To me these pieces culminated in the integration of animal, plant and human forces. Individually there was a cleanness and certainty of intent.

The Awe with its sweeping motions created a reverent expression as it grasped as if to envelope the delicate floral form. *Jehu—The Driver* with its skeletal animal-like form was a gestural piece which summoned ancient civilizations, bridging the gap of space and time. *Bi-Shell X—Falocalte Claviform* joined momentarily animal to man in anthropomorphic unity. *The Awakening* brought to mind the simple gesture of a stretching cat—rib cage pushing through tightly stretched flesh.

Much of Seppä's jewelry was small and delicate, accented with a colored stone. Particularly exciting were the "tessellation" pieces, mosaiclike with their web of open texture, which was successfully used with bracelets, neckpieces and pins of gold and silver. Two extraordinary pieces were *Delphinium* and *Lupin,* sculptural forms employing "tessellation" texturing. Their sweeping, fluid structure culminated in a brightly colored blue or red floral form. The translation was not literal, but rather intensely metaphorical in structure and gesture.

Clearly, this show was one of Boston's best presentations of metalwork. This work is not quick, simple or easily understood. It demands that the viewer be involved visually and intellectually.

Annual Invitational
Atelier Bernd Munsteiner, Stipshausen, Germany
October 31-November 14, 1982
by Erich Frey

Every year in autumn, Bernd Munsteiner invites a few artist/craftsmen in sculpture, graphics, textiles, pottery, gold- and silversmithing and stonecutting to exhibit at his gallery. In fact, Munsteiner's gallery has gained a reputation as an oasis of creativity. Its notoriety extending beyond local circles and even Europe, the gallery attracts streams of visitors to the secluded little village. One reason for this phenomenon is Munsteiner's own reputation as an exemplary gemstone cutter. Both because of this and because of his careful selection of exhibiting artists and his first-rate presentation of the work, the gallery has flourished.

Following is a brief description of the work in this year's exhibition: Munsteiner's own work is a rare symbiosis of metalworking and creative stonecutting. It is oriented toward presenting the stone, revealing and maximizing its impact by the cut. One piece in this show was a cast bracelet in which the upper surface was an enormous aquamarine. Deborah Aguado exhibited two series from her current work *Facades* and *Night Trains.* In *Facade II,* alternating planes of patterned surfaces of metal were put into effect by the wearer's movement and the viewer's position. Klaus Ullrich's bracelets, rings and neckpieces revealed an intense concentration on intimate surface texture and customized mechanisms. From a distance the work seemed quiet and simple, based on traditional jewelry forms, but on closer inspection its sensitive articulation exposed an intense concern with surface and movement. Jürg Eggenberger's work was diminutive in scale and rich in materials. For example, he used colored sapphires and cultured pearls in very high karat gold. Some of his work was exhibited with four ensembles that he had designed, which realistically took fine contemporary jewelry into high fashion. Erich Frey came from South Africa, where he has maintained a studio for some 20 years. He naturally involves a tradition of wood and stonecarving in his jewelry, which uses the carved, opaque material as foundation. Also shown at this exhibit were pottery by Heiner Balzar and paintings by Max Rupp.

Contemporary Swedish Silver
The Society of Contemporary Swedish Silver at the Showroom of Dux Interiors, NY
November 2-23, 1982
by Åke Huldt

In 1963, a nonprofit organization was founded in Sweden to promote the maintenance of the time-honored traditions of Swedish silversmithing and to offer aid and encouragement to the group of talented silversmiths of our time.

The society (NFS) has two categories of members, which number about 200 in all: active artist/craftsmen and supporters/collectors. The professional standing of a person who wants to become an active member of the society has to be examined for both technical and artistic skills by an expert commission including two silversmiths, representatives of the national gallery and other institutions and art critics, before being enrolled.

The activities of the society are focused on widening public appreciation of handcrafted silver and on facilitating contacts between craftsmen and customers. For this, a permanent Gallery of Contemporary Swedish Silver has been set up at Karlavagen, 59 in Stockholm where products by member artists are for sale. The gallery also offers to members one-person shows of their work and arranges from time to time collective shows on special themes, such as "silver for the table," "awards and prizes," "new jewelry" and so on. All work for sale at the silver gallery or for exhibitions is selected by a jury.

NFS also organizes traveling exhibitions

around Sweden, mostly arranged in collaboration with country museums, as well as abroad. Amsterdam, Copenhagen, Berlin, Brussels, Monaco and Tokyo are on the list of cities where exhibitions of Swedish silver have been mounted.

The New York show this fall was the largest ever undertaken by NFS, with 39 silversmiths represented. Composed of 250 unique pieces in sterling silver or 18k gold, the show offered a comprehensive picture of fine metalsmithing in Sweden today. Sculptures, bowls and vases, tableware and jewelry with precious stones emphasized in glittering display the excellent craftsmanship and artistic ability of the participating artists. Roots in Swedish traditions were generally noticeable in the shapes of elegant simplicity and delicacy. However, experimental work of innovative and imaginative strength was also apparent. The work at this exhibition was for sale, and two pieces—a bowl by Bengt Liljedahl and a vase by Theresia Hvorslev—were acquired for the collection of the Cooper-Hewitt Museum in New York.

Saints, Martyrs and Savages: Enameled Jewelry by William Harper
Kennedy Galleries, New York City
November 29, 1982–January 7, 1983
by Antonia Schwed

"Gorgeous" is used so often in a slangy way that for many it may have somewhat sleazy connotations. Actually, however, in Webster's the first definitions are: "Brilliantly colored; magnificent; resplendent." And it is with these definitions in mind that I apply the adjective "gorgeous" to William Harper's second exhibit at the Kennedy Galleries in New York City.

In this small and elegant show only 22 pieces were on display and they were all jewelry. Pendants, brooches and stick-pins, marvelous small constructions, were enameled with the skill and artistry that is Harper's. Melanges of transparents were subtly enhanced by the judicious use of foils and opaques, the latter with a matte stonelike quality. As seems to be his wont, Harper embodied in the pieces the primitive elements of teeth, bone, shells, claws, hair, feathers, objects that evoke a kind of subconscious response in the viewer. Most of Harper's fascinating little beings have compelling faces looking out from behind masklike forms, a concept which adds to their presence and mystery. I was particularly drawn to Saint Aborigine, a gold, silver and copper pendant, a complete and commanding figure with details of bone, shell, claw. I also thought the martyr brooches were stunning, their cloisonné-spotted faces appearing infinitely sad and weary and done in superb colors. Looking at the pieces one by one, it was difficult to pick favorites as they were so bemusing. As a matter of fact, in this exhibition it was a bit of a problem really to *see* them one by one. At first glance the pieces, purposefully arranged to emphasize the series aspect, tended to look too much alike. This did each one an injustice and was a deterrent to the individual study and appreciation each one deserved. I am a little ill at ease with this whole series concept. Harper's work is too fine to need any sort of device.

Enamels 82
Dimrock Gallery, George Washington University, Washington, D.C.
October 20–November 12, 1982
by Gretchen Klunder Raber

Drawn from a broad spectrum of styles, techniques and quality, the National Enamelist Guild presented its quadrennial national juried show in the fall of 1982. If one word could succinctly express the tenor of the show, it would be ambivalence. Initially this was fostered by the jurors' statements and ultimately reflected in their judging: Jamie Bennett selected works "to exemplify the state of the enameling art for better or worse." Constance Costigan felt "simplicity of concept and design might be a good motto for artists in this medium." William Harper reflected that "enamel is both the easiest and most difficult of materials with which an artist can become involved."

This ambivalence was evidenced in the show, where the complexity of achieving mastery of the medium along with expression of the esthetic never came together. Perhaps because of the very experimental and wide-open quality of the show, there were correctable errors and unresolved discrepancies. For example, the state of the metal surface in several excellent pieces was detractive—treating the surface with a lacquer, wax or spray to retard or eliminate tarnish and discoloration would have been acceptable in the present state of more sophisticated exhibiting. Another glaring problem was a piece so ill constructed and fragile one could only wonder why the jurors accepted it. Luckily, the artist was able to send replacement sections for the parts that fell off. One tenet of the code of enamelists should concern the ability to depict figurative subjects. If one cannot draw or paint with other media, it is not likely that there will be an ability in enamels. Truly inept depictions of figures and objects appeared with frequency. In another medium, they would not have been considered.

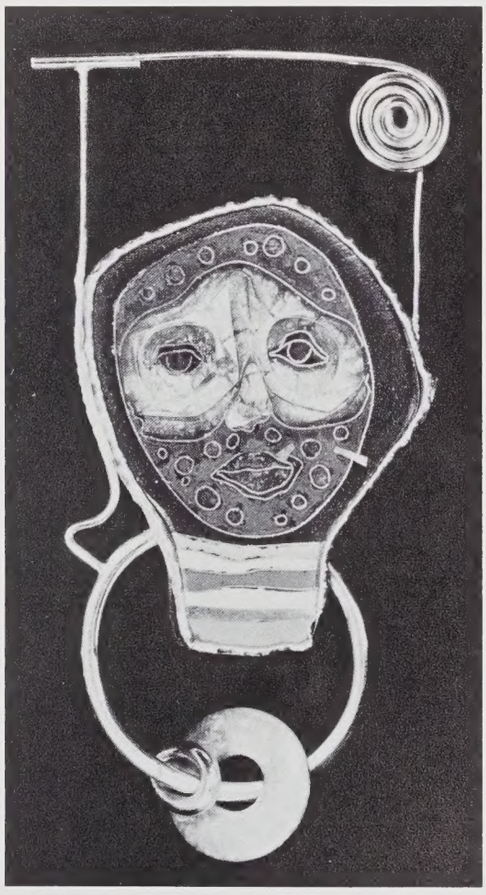
Technical experimentation is another area where jurors and museum curators are susceptible to serious lapses of esthetic judgment. Overwhelmed by the "new," they forget the "good." One particular piece in the show where sheets of glass were enameled in a manner reminiscent of black tar, á la Franz Kline. produced much controversy. A question of the scope of enamel application was justifiably raised by one of the most exciting sculptures in the show, James Malenda's *3 Weights*. Major portions of the designs were made of painted wood; negatively noticeable was the mottled surface of the low-fusing orange enamel on one large surface.

Action painting of the 1940s and 50s received several de rigueur renditions from the basse taille enthusiasts. Several other painting styles were also treated with varying measures of success. One conceptually successful transposition was Ingres's *Odalisque* to Teresa Coates's *Country Boys Can Survive Ingres*. In the latter, only a minor problem with the oil paint technique marred the quality of the work.

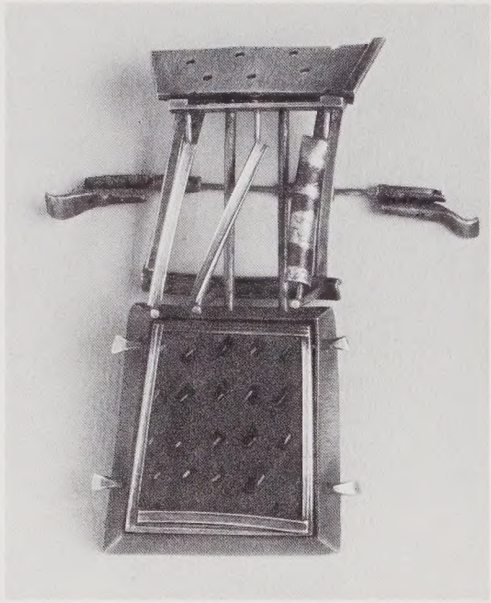
And then there was the magic side of the exhibit: those pieces which exemplified mastery both in concept and technique. One of the foremost the award-winning work of Rebekah Laskin afforded a view of refined understatement and subtle handling of underglaze color and drawing. They were superb examples of less is more, reflecting an identifiable esthetic. Ken Rockwell's work evidenced the same remarkable visual integrity. Marvelously tactile metalwork and adjunct enamel sections were integrated cohesively. Restraint was their strength. This work was among several of the best pieces which exhibited excellent metalwork control. Under the new-techniques-that-work category was the lovely award-winning piece by Sylvia Hamers which used clear, crushed enamel, underfired on silver, to create an intriguing, sparkling effect.

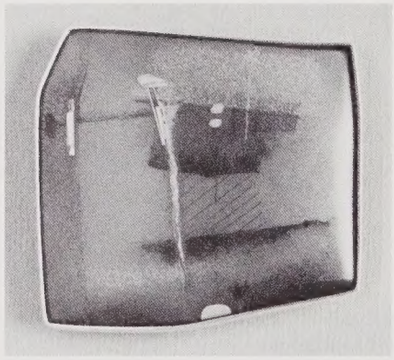
Stencil technique was represented by several applications in the show, some of which were a marvelous synthesis of the graphic and glazing properties of enamel. Dean Drahos's tryptich *The Jelly Bean Condottiere* united several techniques: masterful drawing, stenciled patterns and fumed iridescences with outstanding finesse. Others strong in this technique were Christina Gibson Sears, Jo Ann Tanzer and Peggy Hitchcock. Graphic strength coupled with a sense of metalwork integration lifted the work of Anne Clark, Jane Ferree and Thomas Farrel to a strong position in this show.

The most outstandingly beautiful pieces in the show were the works of Pamela Harlow, whose *Triangle 1 and 2* were total refinements



Top Theresia Hvorslev, *Vases*.
Center Louise Carlman, *Ladle*, silver with jaharanda handle.
Above William Harper, *Matyr II* brooch, enamel





Top Ken Rockwell, *Striper Pin*, enamel, sterling silver, copper, bronze, 1½ x 2½ x ¾". **Above** Rebekah Laskin, *Brooch 1*, enamel on copper with sterling silver, 1⅝ x 1⅝"

of artistic statements rendered in remarkable stoned cloisonné surfaces, countered with foil iridescence. Her work was a testament to handling meterials in a balance of technique and idea. Other pieces of excellent diversity were the work of Connie Brauer, who combined diamonds and opalescent enamel, Harlan Butt's meticulous container, Laurie Hoskin's precision cloisonné, Belle and Roger Kuhn's dazzling microcosms of textured foil and the marvelous humor of Correen Kaufman's *The Sheep: Ascent to Heaven*.

Passing Out, and the Debate that Followed
Goldsmiths' Hall, London, England
October 11, 1982
by Barbara Young

In this year's "Passing Out" exhibition, the annual show composed of graduate work taken from art colleges and polytechnics, a surprising "artsy-craftsy" or "trendy" element was operating. This took the form of an unusual abundance of nonmetallic materials—leather, wood, plastics. By and large these mixed media, or totally nonmetallic expressions, felt decidedly experimental, even as defiant gestures, unsupported by thorough knowledge of the materials' potential, nor sufficient manual skill to execute the pieces unselfconsciously. There were tricked-up odds and ends, not sincere craft, not genuine commercial, just trifles all dressed up with no place to go. And beads.

There were to be sure more serious inquiries, finely crafted, such as those into mokumegane, a technique in an altogether different evolutionary position here than in the United States, where it has undergone intensive experimentation beginning back in the late 60s. As for the holloware in Britain, this category has yet to be desecrated by energetic willfulness and gain entry into that broader stream of personal expression, lying somewhere between art and craft, idea and thing, or as pure sculpture. Its sober practitioners gently coax it year by year towards sane consumer respectability, though one cocktail set owed a huge debt to its Art Deco precursor, all save the lemon slice finials.

Could it have been that the broad spectrum found among the objects in the showcases, from trivial to excellent, reflected an anxious inter-school competition, or, was it too-lax guidelines for material accepted for the show? If the pieces had been displayed not like a trade fair, but like a proper exhibition, that is, with enough space between objects to be able to concentrate on them selectively, the overall impression could have been substantially elevated. And, if the lightweight pieces had been left out altogether, this could have been realized in the same space.

Students typically are poor judges of what is their best work, but surely college staff members should be able to make up their minds, at least by the time they pack their crates to send to Goldsmith's Hall.

The Debate. The occasion of this year's exhibition was taken as an opportunity to organize a debate, between representatives of the schools' metalwork departments and the jewelry and silverware manufacturing industry, in which they confronted what has become their mutual problem, the low level of employment of trained designers in the industry. The fact that the low level of employment has become a mutual concern is more a statement of economic fact than one denoting any mutual understanding. The exhibition alone stands testimony to this fact. A group of manufacturers passing among the showcases were heard thoughtfully questioning whether or not there would be anyone left in a few years who could work silver, or any metal at all.

The trade's representatives were very forthright in what they saw as failures on the part of the polytechnics to train graduates for practicalities of a career in industry. Lack of professionalism, shoddy workmanship, impractical ideas and lack of technical expertise were cited as major stumbling blocks for the young designer as far as industry was concerned. In all fairness, it must be noted that other manufacturers cited successful experiences employing graduates.

The art schools' representatives defined their courses, speaking to the general ideals of education rather than specifically training for the industry. Further, they were quick to point out that their courses must conform to strict guidelines set out by validation authorities (composed of what professionals one wonders?). And it was suggested that industry should not expect a fully trained craftsman coming directly from college.

In retrospect, it seems incomprehensible that educators did not simply confess the fact that they do not, cannot, or will not address seriously the subject of industrial design in their curriculums instead of beating around the bush. The truth is that British metalwork education is essentially craftwork education despite student participation in competitions promoted by manufacturers, appreciated as they are by all concerned. However, it would be naive to assume, as all concerned must know, that just because a student's design is mass-producible it necessarily follows that the student understands the underlying principles of industrial design. On the contrary, far from entertaining curiosity there is, generally speaking, a decided apathetic or even hostile attitude among students (and staff) towards the subject of industrial design. And things are likely to remain as they stand until there is an active and enlightened campaign on the part of educators to uproot the romantic, craftsmanship ideal and replace it with an openminded, practical one defining the various functions of art, design and craft in today's world. People seem to forget these pursuits have been constantly undergoing redefinition throughout time, even as they are today, subject to conditions no sector could ever control.

The debate concluded on the general concensus of opinion that greater liaison between art colleges and industry would be greatly beneficial to all. Several requests were made that Goldsmiths' Company should assist this liaison.

With the dialogue now beginning under the benevolent guidance of the Goldsmiths' Company, there is reason to hope for renewed enthusiasm being generated on both sides and eventual clarification reached between education and industry as to their mutual needs, objectives, and methods. One thing remains absolutely clear, students, British manufacturers are calling for designers—now.■

Ann and Terrence Young
Transformation of Elemental Qualities

by Susan Benforado

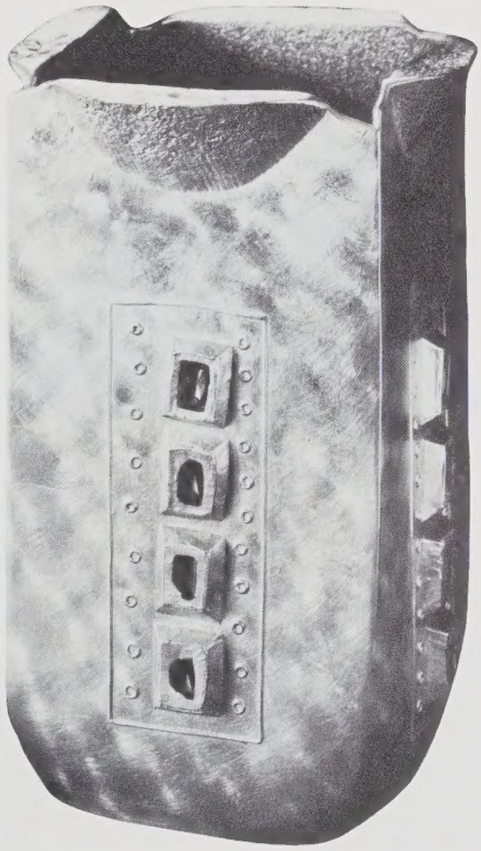
Ann Heiberger Young and Terrence Young: a pair of artists, young, sited in Phoenix, Arizona are of the 1980s. They express themselves, for the moment, anyway, primarily in small metal sculptures and jewelry. Individually and jointly, their work conjures up long-past and far-flung cultures, esthetics, values, and is work which, in appearance, affect and technique is nevertheless undeniably modern.

A necklace by Terrence consists of a series of graded disks. Each disk rises to a salient peak at its center and is surrounded by a slightly raised edge. The beholder's attention is at once focused and dissipated, the eye fixed to take in the whole and tempted to examine each component.

The visual paradox sustains itself in further analysis of the piece's ancestors and living relatives. Each disk might be a miniature Saracen shield. Taken together, they form a Viking-like torque, barbaric and glittering. The finish accorded each part reminds one of painstaking, time-honored Japanese craftsmanship, while the whole, minimal and conceptual as it is, speaks firmly of 20th-century design and form.

A vase by Ann stands foursquare and tall, with rough, textured lips at its mouth, colored eyes staring from its sides. The eyes are enclosed within lines and shapes, which make geometry seem appealingly freehand and immediate. This vase, and its fellows, as well as wall plaques, merit, in fact, all but evoke, the anthropomorphic phrases they call forth from the viewer. One looks at them, studies them, sensing that one is, in turn, looked at and studied.

As an ensemble, or piece by piece, they suggest ritual objects excavated from an unknown and mysterious, and yet coherent and oddly familiar, culture, self-explanatory in their silence. At the same time, they, too, declare their allegiance in form and affinity. Enlarged, they could serve as props for Martha Graham's performances, conjuring up the same, primal essences as do Noguchi's



Above Terrence Young, *Necklace,* sterling silver, 19″ l. Photo: Dave Wood. **Right** Ann Young, *Vase,* Britannia metal, with cut glass, 6½ x 3¾ x 3¾″. Photo: Dave Wood

Susan Benforado holds an M.A. in art history from the University of Toronto. Currently, she is living and teaching on the Alamo Navajo Reservation in New Mexico.

stage decors to human nature, unchanging, and to their own time.

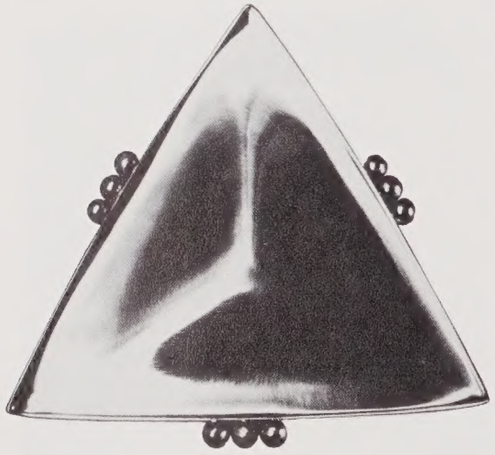
Little in their biographies prepares one for the powerful, time-machine nature of their works. Terrence, born in Massachusetts, raised in Hawaii, studied architecture at the University of Michigan, graduated with a degree in art and eventually migrated to Arizona, where he spent four years with Paolo Soleri, working with the ceramics setup in the foundry. In 1975, he went to Haystack in Maine on an Arcosanti-Haystack exchange; it was there that he was introduced to jewelrymaking and, not incidentally, to Ann.

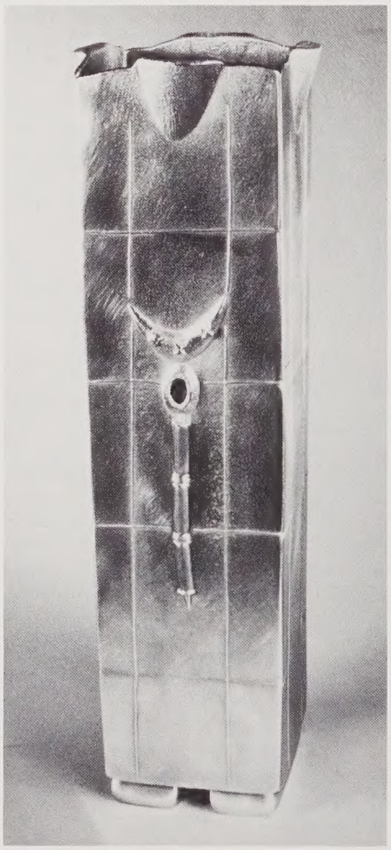
Ann has been involved with jewelry relatively longer, since 1970, when she began spending three hours a week in a woman's basement studio, learning to hammer and pound. From there, she moved to Haverford, Pennsylvania YMCA, to a craft gallery, and then to an attic workshop, from which she produced wholesale work with only a hammer and stump for company. Eventually, she collected a B.F.A. from Virginia Commonwealth University and an M.F.A. in metal and sculpture from the Rhode Island School of Design. These, with the interlude as a teaching assistant at Haystack, constitute her formal training, mere milestones in her self-defined, long-term and not necessarily conventional process of learning.

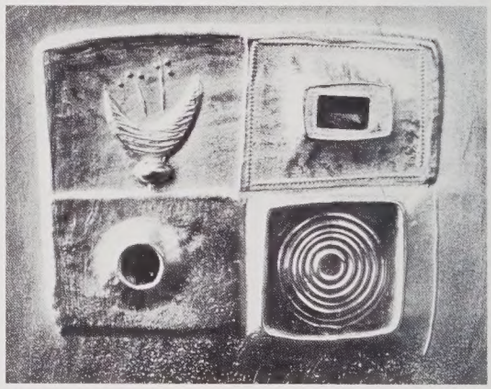
This is an attitude the two appear to share. Both are technically adept, knowledgeable about metal, yet seem interested in technique and technical knowledge only insofar as it meets their own, internal requirements for a piece. Both are artists before they are jewelers or metalworkers, although they produce jewelry and metalwork. Both identify strong outside influences which, somehow, result in works which are pure Terrence or Ann. Terrence mentions Miro, Noguchi, Rothko; Ann acknowledges Matisse, Noguchi and a curious, glittering creation, built from odds and ends and imagination, by a man named James Hampton, and called *The Throne of the Third Heaven of the Nations Millenium General Assembly,* which she saw at the Boston Museum of Fine Arts in 1976. Although they work quite differently—he starting abstract, from sketches, she beginning with a readymade object or shape and transforming it—they work well together, benefitting from the other's presence and ideas.

Terrence sums up their mutually evident approach, "We try not to imitate; we try to emulate. We are looking for values, for the essence of a work." Ann speaks, too, of elemental qualities of place and of objects as her prime influences. When one adds together their separate and collective fascinations, from earthworks, past and present, to 20th-century painting, from architectural philosophies to found objects, the net is more than a compendium of influences, shaped by technique; the net is an ethos, a way of life and work guided by belief.

Work by Ann and Terrence Young can be seen at The Hand and the Spirit Crafts Gallery, 4222 N. Marshall Way, Scottsdale, AZ 85251. ■







Above Terrence Young, sterling silver, 18k gold, 2 x 2". **Center** Ann Young, *Vase,* inlaid brass, yellow Austrian cut glass, blue Venetian glass tubes, 12 x 3 x 3". **Right** Ann Young, *Wall Panel,* detail, Britannia metal, inlaid mirror fragment, yellow Austrian cut glass, brass bead, brass foil tracing

Health Hazards

Questions & Answers
by Linda Weiss-Edwards

Does extended use of vibrating tools cause any damage to the fingers and hands?
Art Hazards News (November, 1981, Vol. 4, No. 11) responds as follows: "White Finger" or Raynaud's Phenomenon is a disease caused by long-term exposure to vibrating tools such as pneumatic chipping, air hammers, chain saws and grinding tools. Beginning symptoms of numbness in the fingertips can begin after only two years of exposure. In more advanced cases the fingers and hands can become permanently numb, and in some instances amputations have been necessary.

The prevalence of this disease in industry is much wider than had been thought. A recent study by the National Institute of Occupational Safety and Health in Wisconsin found that nearly half the metal foundry workers studied had the disease. Other studies, according to the *New York Times*, have shown that between 20% and 90% of foundry workers using chippers and loggers using chain saws develop this disease depending on the duration and intensity of exposure.

Sculptors using these vibrating tools should be aware of this potential hazard and alert their physicians to be on the watch for early symptoms of Raynaud's phenomenon. Preventive measures include frequent work breaks, keeping the hands warm and having comfortable hand grips on tools.

The noise level of machinery in our class workshop is often very high. Will this in any way affect hearing?
Art Hazards News (October, 1981, Vol. 4, No. 8) presented the opinion of Bruce M. Siegenthaler, Ph.D., Research Professor, Speech Pathology and Audiology at the Pennsylvania State University on this subject: Federal and State governments have recognized on-the-job hazards to many industrial workers. Much less attention has been given to hazards experienced by the working craftsman. The Center for Occupational Hazards and its Art Hazards Information Center provide craftsmen with information regarding noxious and harmful conditions to which they expose themselves, but relatively little information is available to the craftsman regarding noise exposure and resultant hearing loss.

Exposures to very loud sound may result in hearing loss due to damage of the inner ear nerve endings of hearing. During its early stage, the hearing problem from noise exposure usually occurs as a temporary threshold shift, and several hours away from noise results in hearing recovery. However, repeated exposure to noise, each time with some temporary threshold shift, eventually results in permanent threshold shift or hearing loss. Overt pain in the ears following the excessive noise exposure is rare, and frequently there is no noticeable sensation other than loud sound during the exposure.

While the ear has a built-in protective device against loud sounds, the mechanism operates much better for continuous sounds than for impact sounds. Therefore, impact or explosive sounds are much more damaging to the ear than equally loud sounds of a steady state.

Federal standards indicate that exposure to noise over 90 decibels is likely to result in reduction of hearing acuity for 2/3 of the individuals exposed over extended periods of time. Sounds over 115 decibels are not permitted at all for industrial workers. According to federal standards, a sound level of 90 decibels is allowed for an industrial worker for a maximum of 8 hours per weekday.

Sound level measurements were made in the shops of a number of craftsmen. While most shop noises were not at harmful levels, several had considerable potential for damage to hearing. For example, a 2500 rpm HP router mounted on its table generated between 102 and 106 decibels. A power table saw and a 24 inch surface planer with chip collector system both generated 99 decibels of sound.

A jewelry maker, while forging, consistently generated impact noises up to 110 decibels, and often beyond that level. For example, using a crosspeen hammer on a 3 inch by 4 inch bronze plate generated impact sounds of 124 to 127 decibels. This jewelry maker's work rhythm is such that while forging a belt buckle, she would receive approximately 9500 noise impulses well over 100 decibels. That is, in a three-hour work session with one and half hours of forging, she would receive approximately a one day's allowance of impulse noise exposure.

While it would be unusual for a craftsman to be exposed eight hours per day every day of the week to high intensity noise levels, individual variability in susceptibility to noise damage should lead to caution regarding noise exposure. Relatively short but repeated exposures can result in gradually increasing and permanent hearing loss.

Warning signs of potentially harmful noise exposure include fullness in the ears, ringing in the ears, dullness in hearing, or fuzziness in the quality of ordinary sounds following the noise exposure.

The danger of exposure to high noise levels can be diminished in the workshop by finding ways to lessen the noise level or by consistently wearing ear protectors. Sporting good stores and hardware stores as well as pharmacies sell earplugs and earmuffs which generally are effective in reducing the level of noise reaching the ears. Cotton in the ears is ineffective.

If a craftsman suspects hearing damage because of noise exposure, it would be advisable to obtain a hearing test from an audiologist or consultation from a physician specializing in medicine of the ear. The yellow pages of the telephone book typically carry listings of audiologists or physicians who could serve this function.

Will any materials used in the metalsmith's studio affect unborn babies?
Women artists have been asking about the effects of art materials and processes on their bodies and on their unborn children. In an excellent paper, "The Impact of Hazards on Female Workers," *(Preventive Medicine* 7, 388-348, 1978) Michael McCann, Ph.D., of the Center for Occupational Hazards, discusses at length the problems of women, health effects unique to them, pregnancy and breast feeding, and the home studio. Considering that there are an estimated 78.5 million people working in the arts and crafts of which at least half a million are professionals (and probably more than half of all are women), there is a large population with these concerns.

Research has shown that women react more quickly and more intensely to some organic chemicals, like the solvents, benzene and its related compounds, xylene (xylol) and toluene (toluol). The reproductive systems of men and women are affected by lead, but women who are or may become pregnant also expose an additional risk population, their unborn children.

Many chemicals in the mother's blood stream can cross the placenta and affect the embryo or the fetus: metals like lead, cadmium, mercury and copper; organic solvents, alcohols, dyes, carbon monoxide. Noise and vibration also affect the fetus. Heavy metals and organic chemicals can cross into the mother's milk and be present many hours after exposure is ended.

The solutions to the problem of potential health hazards for women in the arts is explored at length by McCann, and they are virtually the same preventive measures that are recommended for everyone.
1. Know your materials, learn their hazards.
2. Use proper ventilation. A window exhaust fan may be a good start toward achieving a clean air supply, but if you work in a large institution you may need professional help in determining how to get that clean air supply.
3. Wear appropriate personal protective equipment.
4. Use good housekeeping practices.
Added precautions if you are pregnant or expecting to become pregnant in the near future:
5. Avoid working with solvents, resin systems (and paints, varnishes containing either), do not strip furniture, etc., and avoid being in an environment where vapors of these substances are in the air (printmaking studios, offices that are being redecorated, etc.).

Remember that during the first three months, the developing embryo and fetus is very vulnerable. It is probably safer to work with materials and processes that require or produce as few chemicals or metal dusts and fumes as possible throughout the pregnancy and nursing period. Women who live in studios are advised to take a close look at their environments for their own and their children's sakes. (Reprinted from *Hazards in the Arts*, 3, June, 1979.)

There has also been research lately that indicates that extreme noise levels can affect the fetus. There seems to be a direct relationship between an aggressive, unsettled temperament in children and exposure to high noise levels while in the womb. LW-E

Reprints of Michael McCann's paper can be obtained by writing the Center for Occupational Hazards, Inc., 5 Beekman St., New York, NY 10038. Also available from them is *Health Risks in the Arts, Crafts and Trades*, the proceedings of a national conference on art hazards held in Chicago in April, 1981. The book can be ordered for $20.00, plus $1.50 postage and handling.

The Ontario Lung Association has just published an excellent 16-page pamphlet called *Health Hazards in Arts and Crafts*. It is available from the Ontario Lung Association, 157 Willowdale Avenue, Ontario M2N 4Y7, Canada.

Submit questions for this column to Linda Weiss-Edwards, P.O. Box 1032, Sausalito, CA 94966. ■

Metals for the Metalsmith

What are Metals?
by Harry W. Freeman and Greg K. Bouse

Most of us take metals for granted, but do we really know what they are? Many people could not even begin to describe a metal, yet there is probably no product made today that in some way did not use a metal during its manufacture.

The Metal Atom. Among the 103 elements identified, 81 are metals. Of the remainder, 6 are noble gases, including helium, neon, argon, krypton, xenon and radon. The last 15 are called either semimetals or nonmetals. The semimetals include boron, silicon, arsenic, selenium, tellurium and astatine, while the nonmetals include carbon, nitrogen, oxygen, fluorine, phosphorus, sulfur, chlorine, bromine and iodine.

All of the elements have common features, and as early as 1869 the known 61 elements were categorized by scientists in Germany and Russia, working independently. The modern Periodic Table of the Elements, as it was later named, is shown in Figure 1. In it, the elements are arranged so that ". . . the chemical and physical properties are periodic functions of atomic number. That is, when the elements are arranged in order of increasing atomic number and the properties of each element are studied in turn, similarities recur periodically." Metals as a group have many similarities, the standouts however are that they ". . . have a shiny luster and are good conductors of heat and electricity." (from *Chemistry: Principles and Properties*, see Bibliography).

Metals, or for that manner all elements, are made of protons, neutrons and electrons, in differing combinations. Protons have mass and a positive charge, neutrons have mass essentially equivalent to that of protons and a neutral charge, and electrons have approximately 1/1836 the mass of a proton, but carry a negative charge (electrons exhibit the dual wave/particle nature similar to light rays). The protons and neutrons cluster together to create what is called a nucleus, and electrons spin about the nucleus, balancing the internal charge, so that overall the element has no external charge. This combination of protons, neutrons and electrons is what we call an atom. For example, aluminum has 13 protons and 14 neutrons in the nucleus. The 13 positive charges determines its order in the Periodic Table (aluminum is assigned atomic number 13) and together with the 14 neutral charges the atomic weight, 27 atomic mass units (an atomic mass unit is equivalent to 1/12 the weight of carbon, which is universally accepted as the standard) is assigned. Ideally, the aluminum atom has 13 electrons to balance the nucleus and in this state is "pure." However, aluminum tends to lose electrons from the outer shells, as do most metals, which in turn creates an unbalanced charge. Since all matter is constantly seeking to attain a neutral charge, a source of electrons must be found. This supply of electrons often comes from the nonmetals, which usually have a full outer shell of electrons. Oxygen being one such nonmetal forms a very stable oxide with most metals, especially aluminum. In fact, most of us have probably never seen pure aluminum, because it forms a protective oxide film almost instantly upon exposure to oxygen. The oxide is nearly transparent and at times can be colored in a process known as "anodizing."

The Metal Crystal. Upon examination of galvanized steel, one will see a mosaic consisting of different shades of gray. Each "patch" of the mosaic is in fact an individual crystal of zinc that reflects light differently, depending upon the way the atomic planes in the zinc crystal are arranged. These patches are commonly called grains, and each grain consists of zinc atoms arranged in a regular pattern like bricks in a wall, only in three dimensions. Each grain is a nearly perfect structure, often requiring microscopes with magnifications up to 100,000X to find the defects.

Getting back to the zinc crystal, imagine a hexagon with a zinc atom at the center and a zinc atom where the sides of the hexagon intersect. Now, connect the zinc atom in the center to the zinc atoms on the circumference of the hexagon and you will notice that the hexagon is divided up into smaller units resembling equilateral triangles. By drawing a continuous repeating pattern of these triangles, with a zinc atom at each intersection, you have just created an imaginary atomic plane for zinc. This is called the basal plane. Stacking these planes in regular order will then begin to build a crystal of zinc. The other common metal crystal structures include the body and face centered variations of a cube, as shown in Figure 2.

Metal Deformation. With a random grain orientation, a metal can be most easily deformed. If a hammer is used to flatten a piece of silver, for example, the metal will expand in the length and width direction (while contracting in the thickness direction). The "strain" imposed by the hammer blow was accommodated from grain to grain. Let's start with an annealed piece of silver. As the silver is worked (and strained), defects called dislocations are created, which accumulate. As they accumulate, the metal will harden. At some point, no more dislocations can be accommodated and the metal will crack. At this point you can say that the metal has exceeded its capability to be strained (or worked). Now, to avoid cracking the deformed metal, it is usually necessary to anneal, by heating to approximately 1/2 or 1/3 its melting point, where the dislocations dissolve out of the grain, leaving a nearly perfect crystal again.

Why can metals be worked this way, and other periodic groups, such as the nonmetals, act completely differently? It has to do with the nature of electrons and the directional character of the metal structure. The outer electrons in the metal structure are shared between several atoms, a condition which is unlike nonmetals that do not need to share electrons because they have full outer shells. This creates a "sea of electrons" and tends to hold the atoms together, preventing them from cracking apart. This ultimately increases the ability of metal to be worked. In addition to the sharing of electrons, metals have a more continuous structure, allowing the strain of deformation to be more evenly distributed on several of the atomic planes. This also increases the ability of the metal to accommodate strain, preventing the metal from cracking apart during deformation.

Conclusion. This concludes the introduction to "What are Metals?" Undoubtedly, many questions will be raised and justifiably so, because this treatise is far from complete. We hope, however, that you may have an appreciation for what metallurgists such as ourselves may spend our entire working careers studying. For those of you with specific questions, or who wish to have some metal "phenomenon" explained, we will try to answer them in subsequent issues. Send questions to *Metalsmith*, Sarah Bodine, Editor, 1 Penn Lyle Rd., Princeton Junction, NJ 08550. ■

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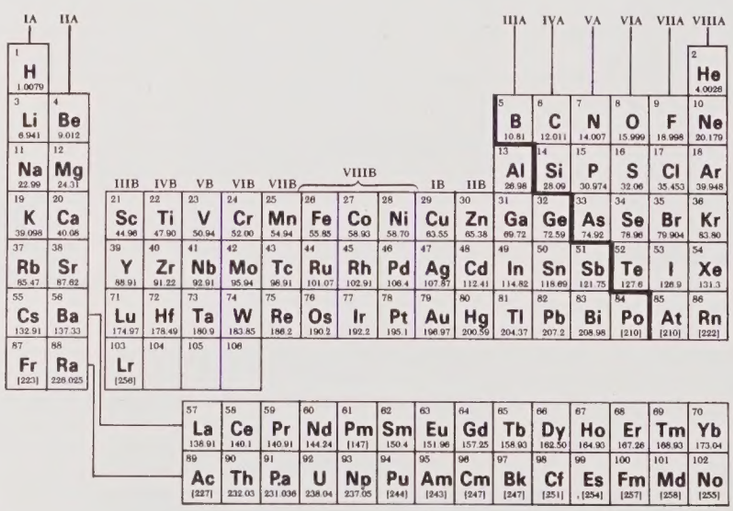
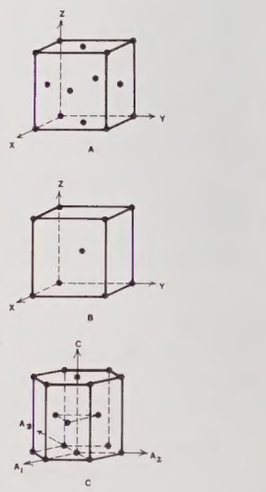
Acknowledgment. Greg Bouse would like to thank Dr. D.R. Parker of the General Electric Company and Dr. B.M. Guenin of TRW Incorporated for reviewing this article.

Harry W. Freeman is a former materials engineer with the Navy. Greg K. Bouse is a metallurgist with TRW Incorporated, Cleveland, Ohio.



Periodic Table of the Elements
Metallic elements are found below and to the left of the heavy "stairstep" line which separates B, Si, As, Te, and At from Al, Ge, Sb, and Po. Nonmetals are found above and to the right of this line. The elements along the line are referred to as semimetals. Representative elements: A groups Transition elements: B groups Inner transition elements: Nos. 57-70 and 89-102



Principal Crystal Structures of Metals
A sketch of the (a) face centered cubic structure, (b) body centered cubic structure, and (c) close packed hexagonal structure. From *Engineering Materials and Their Applications*, New York: Houghton Mifflin, 1975, p. 31

Book Reviews

National Directory of Shops/ Galleries, Shows/Fairs: Where to Exhibit and Sell Your Work 1982/83, edited by Sally Ann Davis, Writer's Digest Books, 9933 Alliance Road, Cincinnati, OH 45242, 1982, 572 pages, $18.95 cloth, $12.95 paper

A bargain at $12.95, this 572-page paperback contains detailed descriptions of over 2,300 outlets in th U.S. and Canada, supplying information not easily obtainable elsewhere. Aimed primarily at the professional craftsman, it can also be used effectively by gallery and shop directors as well as collectors, consumers and the traveling public. Supplemental chapters on such subjects as contracts, photographing craft objects, slide and photograph submission, packing, display and related business practices would be of minor interest to the experienced professional but could serve as guidelines for new entrepreneurs. There are also a number of interviews with craftsmen, fair directors, shop and gallery owners.

Unfortunately, however, this directory is a good idea gone wrong, because the arrangement of the individual entries in the body of the book is such that tracking down specific shops, galleries or events is a difficult and frustrating process. This arrangement, plus lack of indexes, makes it impossible to ascertain what business opportunities exist in a given place at a given time.

The book is divided into two sections: Part I covers shops and galleries, Part II shows and fairs. These sections are further subdivided into 10 geographical regions: Northeast, Midatlantic, Midsouth, Southeast, North Central, South Central, Northwest, West and Canada.

It is at this point that the trouble begins, because from here on the entries are arranged in alphabetic order based on the name of the shop, gallery or event. Thus, a shop in Connecticut is cheek-by-jowl with one in New Hampshire. If you didn't know that the American Craft Enterprise's fair at Rhinebeck is called the "Northeast Craft Fair," you would have to run through the entire Northeast list to find it. This alphabetic arrangement prevents the user from knowing what shops and galleries, shows and fairs exist within a given city, town or area. No geographical index is provided to correct this omission.

The lack of an index to sponsors denies you the knowledge that ACE and other promoters produce other fairs that might be of interest. Furthermore, because there is no chronological index by fair date, you have no idea what fairs are taking place at a given time.

The information contained in the individual entries is specific and useful. Shop/gallery descriptions include name, address, telephone number, contact person and title, type of shop or gallery, business hours, number of artists represented. In addition, there is a definition of the craft media handled and kind of objects sought. Business terms and policies are detailed (method of viewing new work, mark-up price range, whether consignment or purchase). In some cases, there is an indication of the heaviest wholesale buying and best selling times. A profile of the shop/gallery and its clientele is supplied by the owner. The shops and galleries listed include some of the oldest and most prestigious as well as newer, consumer-oriented outlets, museum shops, cooperatives and gift shops that stock craft objects.

The entries for shows and fairs provide name, address, telephone number, sponsor and contact person. Also given are the attendance figures based on the previous year and, in some cases, total sales figures. Although the exact fair date is now provided, the description notes the number of days the fair is held and the month in which it occurs. There is a detailed description of the media considered for inclusion, the sponsor's terms (restrictions and responsibilities of both parties, method of entry submission, display area size, fees, deadlines) and number of craftsmen participating. There is also a sponsor-submitted profile of the event.

Were it not for the awkward arrangement of its contents and the lack of indexes, this directory would be an invaluable marketing and finding resource. Perhaps, in future editions, the editor might consider reordering the entries by geographic location (first by state, then subdivided by city and town). In this case, alphabetization would be based on the name of the city or town in which the shop/gallery and show/fair exists. The alphabetization point could be printed in bold type or used as a subheading. Indexes to fairs based on the date the event occurs, the sponsor, and, perhaps, name or title would provide added flexibility and access to information. In the case of fairs, the month in which the event takes place could be printed in the margin, preceding the entry. Shops and galleries could be indexed by title.

Craftsmen seeking additional outlets should, in spite of its shortcomings, take a look at this directory. A note to the editor from a professional audience expressing ideas or suggestions would go a long way toward its improvement. As a single source of information, especially about shops and galleries, which comes out far in advance of the event, at a reasonable price, this book deserves nurturing.

Other Sources of Craft Fair Information. The proliferation of craft outlets is becoming more and more difficult to record; no single resource can do it all. There are, however, a number of publications that are attempting to capture this information, particularly about craft fairs and events, on a regular basis with more or less success.

Most of the monthly and bimonthly craft publications present calendars of events and announcements of shop/gallery openings and closings. Sometimes these suffer from too little, too late. *The Crafts Report* (Monthly. 3632 Ashworth North, Seattle, WA 98103) is, however, an excellent source for this kind of information.

Many state and local craft organizations furnish fair schedules in their regular newsletters. For comprehensiveness, it would be hard to surpass the *Guild of Connecticut Craftsmen's Newsletter,* a monthly which devotes 4-10 pages to a tabulated list of craft fairs in Connecticut and nearby states. The information supplied includes show title, address, contact person, deadline, eligibility, entry fee, commission, if any, and exhibition hours. Large or small, craft organization newsletters are very helpful sources of local or topical information.

State arts councils sometimes publish calendars of activities and events (including craft fairs) occurring within their borders. Michigan Council for the Arts, for example, issues *Arts and Crafts Fairs and Festivals,* which lists over 200 events along with information that includes estimated attendance and a coded description. Write to your own state arts council for information about the availability of such a list for your state. A list of state arts councils can be found in *The American Art Directory* (Jacques Cattell Press/R.R. Bowker Company), usually available in public or academic libraries.

There are also a number of publications whose primary function is to deliver information on craft fairs: On a local and regional level, look for the following. *The Craft Fair Guide* (Quarterly. Lee Spiegel, P.O. Box 262, Mill Valley, CA 94941) specializes in fairs held in California. Its primary purpose is to provide evaluations of the fairs and their promoters as reported by participating craftsmen and vendors. *Fairs and Festivals in New England and the Northeast* is published annually by the Arts Extension Service, Division of Continuing Education, University of Massachusetts (Amherst, MA 01003). Its entries are arranged in chronological order based on the date of the fair's occurrence. In addition, there is a section for fairs holding wholesale days, a list of craft organizations and other resources in New England and an index to the events based on deadline dates. Each event is fully described.

On the national level, there are such publications as Henry Niles's *Indoor-Outdoor Art and Craft Fairs and Festivals,* Minnesota Findings's *The National Director of Trade Fairs, State and County Fairs and Arts and Crafts Fairs* and *Sunshine Artists U.S.A.* Henry Niles's publication (Bimonthly. 5423 New Haven Avenue, Fort Wayne, IN 46803), no newcomer to the scene, provides descriptions of events arranged in chronological order. In addition, he includes schedules of events held by individual promoters and coordinators. These shows are grouped under the sponsor's name and listed in chronological order. Minnesota Findings's *National Directory* (Annual. 300 South Fifth Avenue, Minneapolis, MN 55415) groups its entries under such headings as trade shows, state and county fairs, art and craft fairs. There is also a list of craft show promoters. Each event is fully described. *Sunshine Artists U.S.A.* (Monthly. Sun Country Enterprises, 501-503 North Virginia Avenue, Winter Park, FL 32789-3192) lists over 700 events by date in each issue. Of special interest are the reviews of specific fairs by participants and state-by-state reports by *S.A.* staff writers.

There is also the whole other world of trade shows that should be considered possible marketing opportunities. Some of these are listed in Minnesota Finding's *National Directory.* Others can be found in the professional journals that serve the giftware, and fashion fields. A partial list follows: *Gifts & Decortative Accessories* (Monthly. Geyer-McAllister Publications, 51 Madison Avenue, New York, NY 10010); *Giftware Business* (Monthly. Gralla Publications, 1515 Broadway, New York, NY 10036); *Women's Wear Daily* (Daily. Fairchild Publications, 7 East 12th Street, New York, NY 10003); *Modern Jeweler* (Monthly. Hurst House, 5 West 10th Street, Kansas City, MO 64105); *Jewelers' Circular-Keystone* (Monthly. Chilton Company, Chilton Way, Radnor, PA 19089).

—Joanne Polster

Jewelry Concepts and Technology by Oppi Untracht, Doubleday, NY, 1982. 864 pages, 1800 black-and-white and 50 color illustrations, 8½ x 11, $60

This tome, while showing how Diderot's encyclopedia might have been written, is a monumental production, 10 years in the making. Only an Oppi Untracht could have brought it forth. And, if one stops a moment to think, 10 years is an awfully big chunk out of one's life.

It has however, one major drawback. Normally, one starts by "looking over" the book, but here one becomes interested and delves further. One cannot put the damned book down. Phones ring, letters remain unanswered, clients clamor, demanding unfilled orders, the landlord waits for his rent. It becomes almost embarrassing. Then one finds clothes becoming too large . . . is it really so long since I've eaten?

By the late 600 pages you decide, you're gonna get back to some semblance of normalcy. You put the book aside, carefully, and try to restore some order to your life. Hunger pangs are slowly

alleviated. You start answering the phone, apologize all around and get back to work. Only the problem remains: how the devil do you comfortably hold and read an 800 page volume in bed at night?

Aside from these minor details, this book is virtually all you need in your jewelry reference library. It describes processes, answers questions, shows by means of hundreds and hundreds of pictures in black and white and full color, world-wide examples of jewelry employing all techniques. It shows, by successive illustrations, how some 30 master jewelers demonstrate their methods of workmanship in productions in their areas of specialty. It describes current techniques, both ancient and new and innovative.

I no longer need my *Handbook of Physics and Chemistry* nor my *Machinery's Handbook.* All such information relating to jewelry are herein contained. There are 120 examples of geometric and morphic shapes, forms and concepts shown in the "Visual Glossary" section. The bibliographies, sources of tools, supplies and services, both here and in England are extensively gone into.

For me this is a frustrating book. I make my living as a jewelry technology editor for *Jewelers' Circular-Keystone* magazine. I answer people's questions. Shall I now refer them to Untracht or shall I just look them up in his book myself? As soon as I clear up some unfinished business I've gotta get back to the book. In my first reading I think I came across a couple of points into which the author and I may go further. Meanwhile, get the book.
—Nathan B. Winkler

The Colouring, Bronzing and Patination of Metals, by Richard Hughes and Michael Rowe, Crafts Council, London. 370 pages, 16 pages in color, £30 cloth

I am so impressed with this book it's hard to know where to start. The design is crisp, the color plates are luxurious and the organization is clear. As I read the book my first impressions were repeatedly confirmed, and, all the while, further delights kept popping up.

The single best attribute of the book is its comprehensive scope. Altogether I counted 1,142 recipes; the bibliography lists 404 sources. Imagine that! Each recipe is clearly presented in decipherable terms with precise instructions for its use. This is supplemented with margin notes to point out safety precautions, possible variations, and differences to be expected between as-cast and polished surfaces. Over 200 samples are illustrated in color (er, colour). The descriptive system is sufficiently clear and so consistently used that I found each of the unillustrated color descriptions to make sense. Typical would be: "Greenish grey on dull metal, Semi-matt"; "Dark slate with purplish tint, Matt"; "Dull greenish brown grain enhanced surface, Semi-matt." As if the sheer volume of recipes is not thorough enough, the authors have included a section of recipes that failed. This considerate effort should curtail a few wild goose chases.

The organization of the material is so simple, we can easily forget the vast chaos out of which all this information has been assembled. A chapter each is given to Cast Bronze, Cast Yellow Brass, Copper & Copper Plate, Gilding Metal (Red Brass), Sheet Yellow Brass, and Silver & Silver-Plate. (Notice that the book does not deal with gold, nickel or white metals.) Within each chapter there is a consistent progression through the colors to be achieved. These very specific chapters are preceded by a studied explanation of coloring techniques, from an excellent discussion on cleaning methods to some intriguing techniques like vapor and sawdust applications.

The first chapter, a 14-page treatise on the historical uses of patination is nothing short of scholarly. It is a pleasure to read such a well-balanced survey. Other strengths in the book are appendices on Japanese alloys and coloring, a glossary of chemical names and an impressive chapter on safety.

I liked this book. Did I mention the helpful drawings? The extra heavy paper? Well, you get the idea. Now, to get the book: So far, it is not available through the SNAG Book Department. The price is listd as £30 with an additional £1 for shipping. Payment must be made through a London bank, and this can be arranged through any local commercial bank for a charge of about $5.00. The address of the Crafts Council is 12 Waterloo Place, London SW1Y 4AU, England.

Metal Colouring passed what is for me the first and last test of a technical book: it made me want to get to work. If this excellent book finds the market it deserves, it will change the kind of work we will see in future exhibitions. Imagine that.
—Tim McCreight

Modern Pewter, Design & Technique by Shirley Charron, Van Nostrand Reinhold. New York, 1973. 140 pages, $7.95

This book is a useful addition to the literature on contemporary metalsmithing. It is well illustrated and informative. The reader is taken carefully and systematically through the basic techniques of forming, joining and finishing. Useful information is given for setting up a studio, and the illustrations are clear and comprehensible. There is a helpful index and a series of tables on comparative weights and melting points. Shirley Charron would seem a well-qualified person to write such a book, as she has had extensive experience in the field.

This is the only book I have seen that deals with contemporary pewter holloware. The title led me to believe that the work pictured would represent a much broader range of style, technique and concept. In fact, much of the work is that of the author, her student and her teacher, Frances Felten, to whom she pays great tribute. Work considered "modern" at the time of writing appears dated after a few short years. Such is the case with many of the examples shown here.

There are some serious omissions in this work. The techniques of welding or fusing pewter are virtually ignored, although they are well covered by such books as William Varnum's *Pewter Design and Construction* and Emil Kronquist's *Art Metalwork.* The separate section on repair work should either be expanded or incorporated in another area. Casting is another serious omission. It is well within the ability of the beginner to make simple molds of wood, sand, cardboard, plaster and other materials. Such information would greatly enhance the informative content of this book. The bibliography is also in need of expansion. Many valuable books on pewter are unlisted and their inclusion would benefit students seeking more comprehensive information.

In sum, *Modern Pewter* at $7.95 is a good value for the beginning student. It should be considered as an introduction to an exciting and stimulating medium.
—Fred Fenster

Silver Boxes by Eric Delieb, Exeter Books, NY 1979. $20.00

I have never had much interest in coffee-table books on metal objects, noting that they were usually filled with tasty color pictures but lacked the nourishing technical information I was after. It seemed to me they were intended for antique buffs rather than working metalsmiths.

Not so with *Silver Boxes,* whose author, Erick Delieb, is well known for another book, *Investing in Silver.* This photo-packed study of English silver boxes from the 16th to 19th centuries invited reading from the start because the large-type table of contents and chapter headings indicated that there was plenty of material of interest to metalsmiths as well as silver box fanciers.

There is something here for everyone. If the history of style is your thing, you'll find ample discussion of debased laurels, scrolled foliates and gadroons. If you are fascinated by the relationship between artifacts and their political and social contexts, you will enjoy reading about the effect of the Cromwellian regime on the design and function of silver boxes. Many process-and-technique-oriented workers will find coverage of a variety of decorative and structural methods: engine turning, repoussé, etching, pique-inlay (silver into tortoise shell), engraving, casting, various types of hinges, catches and lids. Theophilus' method of die-stamping is included as is Cellini's description of lost-wax casting. This is not a how-to book, however, so you have been warned.

Some people are interested in the way the silversmithing craft was organized, who worked where and when. What role the guilds and assay offices played. Did one man, or woman make the whole object or was a piece farmed out to others?

The list of topics to satisfy the omnivorous interests of goldsmiths is extensive. I have left my favorite for last. As I read about the wide range of now archaic purposes these containers served I couldn't help thinking about the field-day to be enjoyed by the object-makers, graduate students and exhibition-piece specialists. What better way to make a "Statement in Sterling" than to come up with a 20th century vinaigrette or patch box? What is a patch box? Well, those ladies in the court of Louis XV with fake black beauty patches on their dimples had to keep them in some kind of container during off-hours.

Then there are pomanders, spice-boxes, sweetmeat boxes, counter boxes, lancet boxes and others equally fascinating.

Delieb has filled his study with fine, well-documented illustrations and absorbing historical and technical material, presented in an interesting, readable style. You cannot help but admire the author's encyclopedic knowledge that serves as the reservoir for this highly recommended book.
—Bernard Bernstein

Many books reviewed here may be ordered at a discount through the Society of North American Goldsmiths' Book Department. For further information and a list of available titles, write Glenice Matthews, 513 Everett St., Wichita, KS 67213.

Metalsmith

Reader Survey 1983

Although we welcome your comments about *Metalsmith* magazine at any time, we also need feedback occasionally in a more structured form. Therefore, we offer this questionnaire as a quick way for you to voice your opinions and ideas. Our readers remain a vital link to what is going on in the field of metalsmithing and jewelry. Please take a few minutes to contribute to your magazine by filling in the questions below and returning the form to us as soon as possible. We will publish results of the survey in the Fall/83 issue of *Metalsmith*. Thank you.

1 Please indicate how much of the following you read in *Metalsmith:*

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2 Are there areas in metalsmithing and jewelry that you feel the magazine is not covering?

3 How much time do you usually spend reading an issue of *Metalsmith?*

less than 1 hour an evening a week a month longer

4 Do you file your copies of *Metalsmith* for future reference?

yes no

5 How many other people do you estimate read your copy of *Metalsmith?*

6 Are you a:

practicing metalsmith or jeweler teacher student gallery owner curator collector

interested observer other, please specify

7 Do you prefer metalwork that is primarily:

functional sculptural

8 If a practicing metalsmith, how long have you been working in metal?

9 In what areas do you work:

jewelry holloware blacksmithing enameling other, please specify

10 What materials do you use and how much do you estimate you spend on materials and tools each year?

11 Do you read the advertisements in *Metalsmith?*

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12 Which ones interest you the most?

gallery products schools other

13 Have you ever requested information, made purchases or attended classes as a result of advertising in *Metalsmith?*

yes no

14 What kind of advertising would you like to see in *Metalsmith?*

15 Where is your studio located?

City State

16 Annual income from metalwork:

$1-1,000 $1,000-5,000 $5,000-10,000 $10,000-20,000 $20,000-50,000 over $50,000

17 From what other sources do you derive your income?

18 Do you sell your work:

at your studio through craft galleries through craft co-ops at craft fairs

through mail order through private commissions other, please specify

19 How often do you visit galleries or museums?

20 Which galleries or museums do you particularly like?

21 Which other craft and metalsmithing magazines do you read?

American Craft Ornament Crafts Report Craft Range Fine Woodworking

Jeweler's Circular-Keystone American Jeweler Jewel British Crafts

other, please specify

22 In your opinion, what is the most pressing issue in the metalsmithing community?

23 Your age? Sex: m f Are you married? Have children?

24 Are you a member of the Society of North American Goldsmiths?

yes no

25 Please use any other space on this sheet for further comments.

Cut this sheet out of magazine and mail to:
Sarah Bodine, Editor, 1 Penn Lyle Rd., Princeton Junction, NJ 08550.

Thank you.

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Metalsmith

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and more

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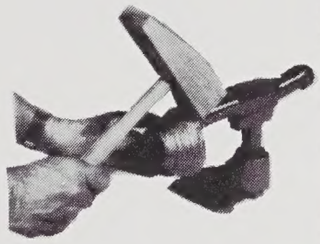

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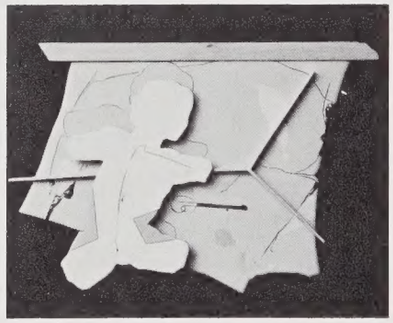

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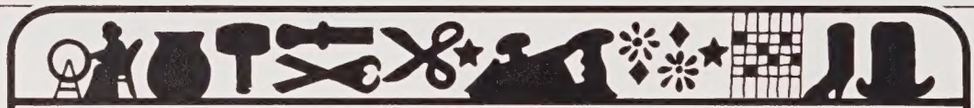

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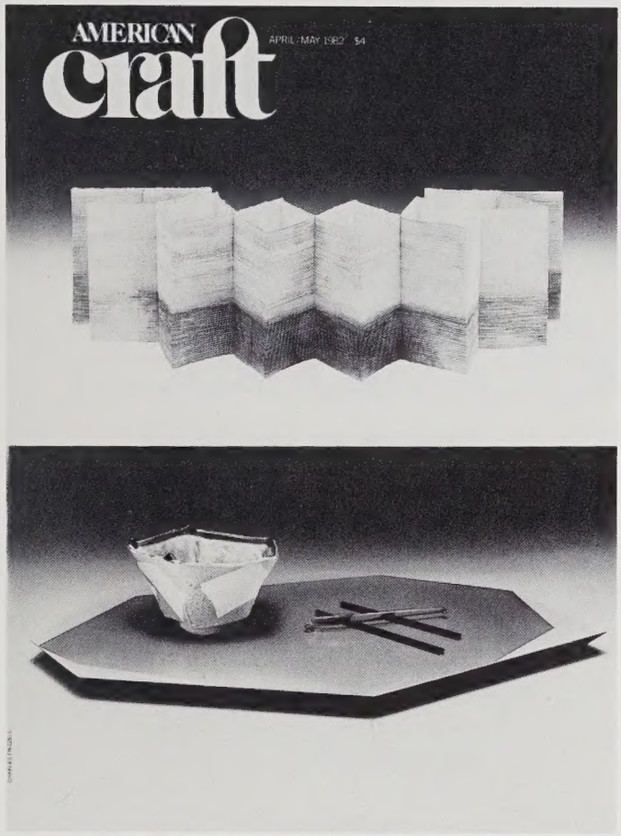

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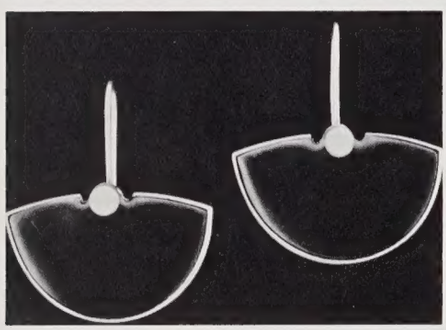

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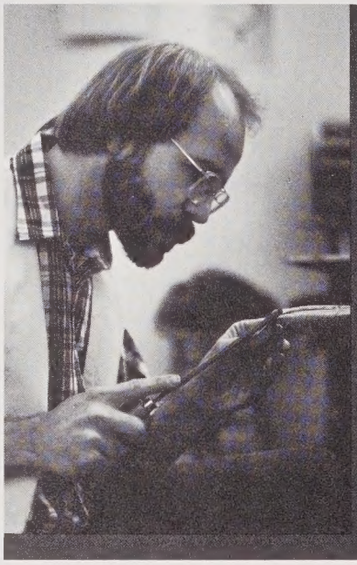

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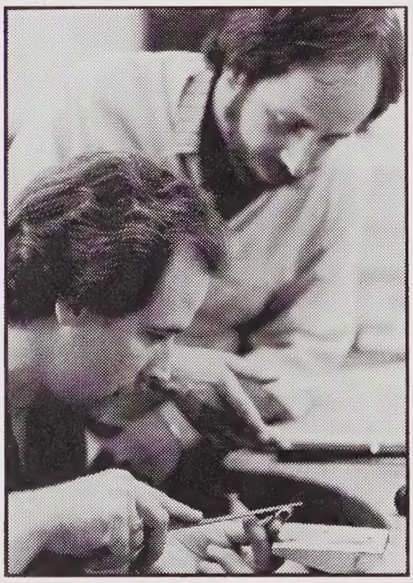

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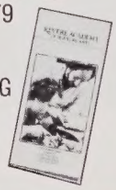

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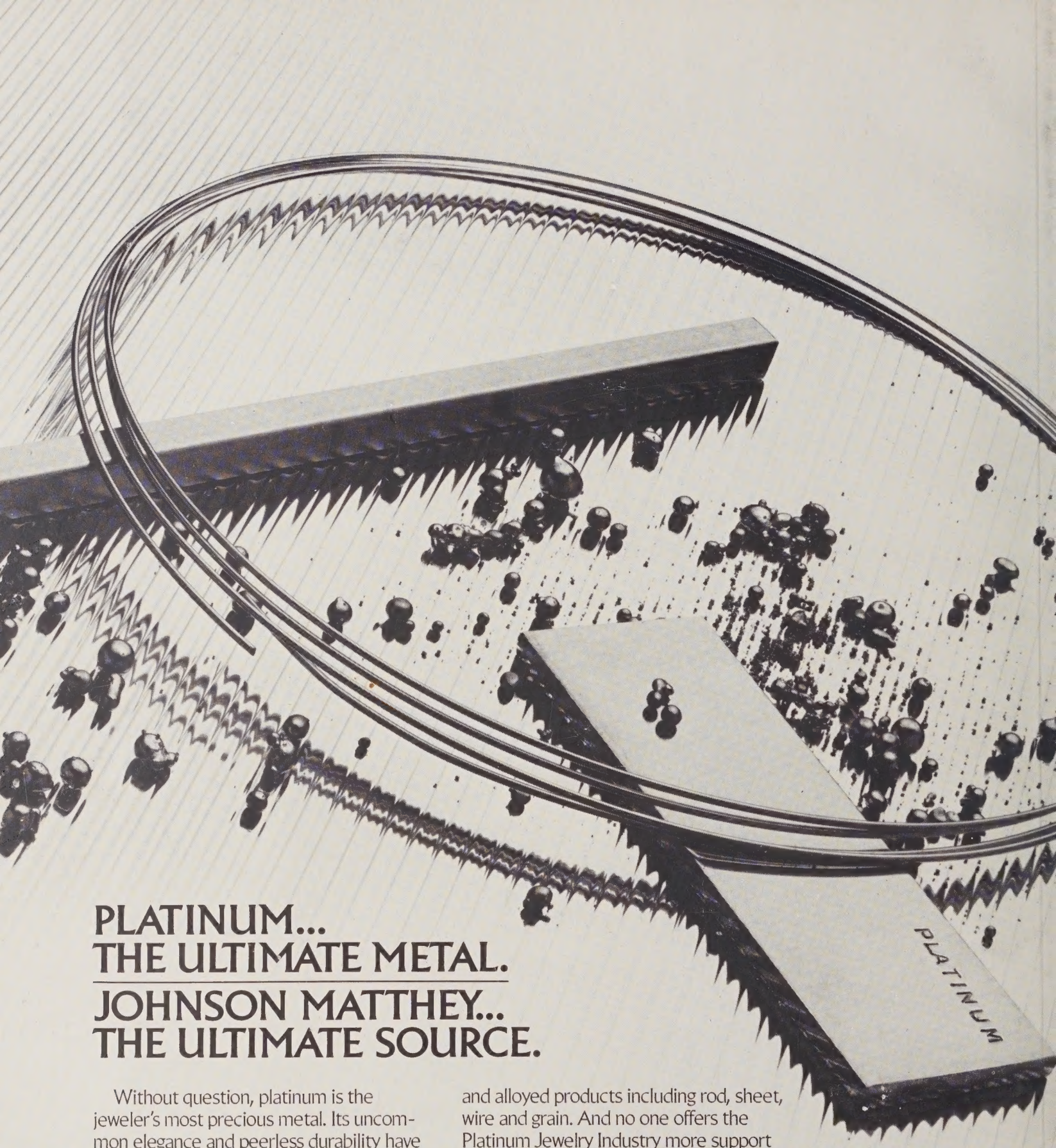

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